NEW REMEDIES.

AN ILLUSTRATED MONTHLY TRADE JOURNAL OF
MATERIA MEDICA, PHARMACY, AND THERAPEUTICS

VOL. XII., NO. 11. WHOLE NO. 113.

FRED'K A. CASTLE, M.D., - - EDITOR.
CHARLES RICE, PH.D., - ASSOCIATE EDITOR.

PUBLISHED BY
WILLIAM WOOD & CO., 56 & 58 Lafayette Place N. Y.

NOVEMBER, 1883.

SUBSCRIPTION PRICE per year, - - - - - $2.00
SINGLE COPIES, - - - - - - - - - .10

Address all communications relating to the **business** of NEW REMEDIES, such as subscriptions, advertisements, change of Post-Office address, etc., to WILLIAM WOOD & Co., 56 and 58 Lafayette Place, New York City, to whose order all postal money orders and checks should be made payable. Communications intended for the **Editor** should be addressed to THE EDITOR OF NEW REMEDIES, in care of William Wood & Co., 56 and 58 Lafayette Place, New York City.

NEW REMEDIES is issued the 25th of each month, dated for the month ahead. Changes of advertisements should reach us before the 10th. New advertisements can occasionally be inserted after the 18th.

REGULAR ADVERTISEMENTS according to size, location and time. Special rates on application.

ELECTROTYPES of the illustrations contained in NEW REMEDIES will be furnished for 50c. per square inch.

EDITORIAL.

The Materia Medica Exhibition at the National Museum.

THE permanent materia medica exhibition at the National Museum was one of the most interesting and instructive sights connected with the Washington meeting of the American Pharmaceutical Association. While our space will not admit of an extended description, we deem the matter of sufficient general interest to warrant somewhat more than a passing notice.

It had been for years remarked and regretted that in this country there was not a single collection illustrating materia medica which could be considered public property, and which from its completeness and accuracy, could be looked upon as a valuable aid to students and investigators. It is true that the pharmaceutical schools each had a collection, more or less complete, for the use of their own students, but both schools and instructors were considerably hampered by want of adequate funds and facilities for collection, and the exhibits were accessible only to a limited number of persons.

So, also, many medical schools and some literary institutions had museums in which the study of materia medica was nominally illustrated by specimens of crude drugs. With few exceptions, however, these exhibits were poorly arranged, the samples were few, and, in too many instances, consisted of unusually large or abnormal specimens unfit for general study because they were not characteristic.

It was eminently desirable and appropriate, therefore, that the Government should undertake the work of establishing a representative and very complete museum of materia medica, which should be as valuable and as well arranged as the botanical museum at the Department of Agriculture, or the ethnological museum at the Smithsonian Institution.

Professor Spencer F. Baird, director of the Smithsonian Institution and the National Museum, became interested in the matter, and so arranged that the requisite facilities should be available and the necessary skilled collector employed. Dr. J. M. Flint, of the Navy, was intrusted with the difficult undertaking, and without delay he commenced the work of organizing the museum. The task was one calling for good judgment, accurate knowledge, and good executive ability. The fact that the field to be covered was world-wide, and the absence of any similar collection in this country added very materially to the difficulty of the undertaking. Dr. Flint set to work with a will, and through the aid of our foreign consuls, and naval officers in foreign ports, he was able to obtain some specimens and considerable valuable information. These agencies, however, were not sufficient for the accomplishment of the main object, *viz.*, the collection of a very complete and characteristic display of all the drugs official in the pharmacopœias of the civilized world. This work has been greatly facilitated by the well-known house of W. H. Schieffelin & Co., of New York, who, with commendable enterprise and generosity, have selected and given nearly all the standard crude drugs in the already large collection.

By the aid of the pharmacopœias of all civilized nations Dr. Flint compiled a list of all the official drugs, and, having this list to work with, the Messrs. Schieffelin succeeded in procuring nearly every article named. Vegetable materia medica is very fully illustrated by characteristic specimens. It is noticeable that these specimens are selected to show the actual average quality procurable of first-class dealers rather than to show the very finest picked specimens in every case. This is important, for, to be of real practical use, the collection should represent the true state of the markets rather than the selections of a scientific expert. Many museums give an incorrect idea as to the appearance of the most common drugs, for the reason that the specimens exhibited are obtained by laboriously selecting perhaps one or two pieces from a bale or case. Obviously a student using such a museum as a source of information will be misinformed as to the real characteristics of the drugs actually used in the preparation of medicines. Where different kinds and grades are sold, this exhibit is especially full and interesting. Thus the various grades of gum Arabic and gum tragacanth, from the commonest to the finest "select," the German and English narcotic leaves and roots, the American and various grades of imported roots and herbs, are all exhibited. The display of Turkish opiums is very valuable, as it consists of assayed specimens of every grade now offered in the Smyrna market. Persian and Indian opiums are also shown, together with their assays. A unique collection of cinchona barks, said to represent all the important commercial varieties, and named by the eminent English quinologist, John Howard, will be of especial interest to professors of materia medica and pharmacognosy.

Not only are crude drugs exhibited, but a very large line of official preparations is also shown. In a special case may be seen one or more specimens of the typical classes of all pharmacopœias, ranging from the concentrated fluid and powdered extracts so largely used in this country, to the very dilute and instable tisanes so popular in France, and from the elegant soluble coated granules and pills to the huge boluses still used in many parts of the world. These preparations are from the laboratory of Messrs. W. H. Schieffelin & Co.

Dr. Flint has done good work, and one involving a great amount of care and labor, in getting out descriptive labels for every article exhibited. On these labels will be found

the pharmacopœial and correct botanical name, a list of the pharmacopœias in which the article is official, and a very carefully worded and very correct description of the substance, its source, uses, doses, etc. In fact, each label contains more real information about any particular drug than is to be found in any but the very best text-books of materia medica.

This collection of official drugs has already been used to illustrate lectures on materia medica given by Dr. D. Webster Prentiss, of Washington. The students of the National College of Pharmacy, and all others who wish to gain an accurate knowledge of pharmacognosy have, in Washington, an unusually good opportunity to see and study crude drugs of the exact quality procurable in the various markets of the world.

It may seem advisable, in the future, to extend the list so as to include domestic and non-official crude drugs. Whether this is done or not, the collection already available cannot fail to be of great scientific interest and value. It is at once an evidence of the foresight of Professor Baird, the industry and zeal of Dr. Flint, and the generosity and public spirit of Messrs. W. H. Schieffelin & Co.

Prescriber vs. Dispenser.

In answer to the correspondent "W.," whose letter was published on p. 314 of our last number, there seems to us but one legitimate conclusion. Leaving out that portion which relates to the professional incapacity of the prescriber, which has no direct bearing upon the question, the fact was as follows: "W." received a prescription calling for two ounces of "chlorine mixture," and without knowing exactly what was meant, he dispensed a mixture which he presumed would answer the purpose. There is no officinal or commonly accepted formula for a chlorine mixture, and in the absence of such definite formula, to dispense anything that came to hand which might be so called would be to assume the responsibility of its administration, or of censure in case the prescriber intended anything else. There is no doubt in our minds that the article dispensed was a creditable thing in itself, but we do very much doubt whether "W." acted judiciously in presuming that it was the thing ordered. Had the prescriber been a gentleman instead of an ignorant fellow, doubtless "W." would have experienced no trouble. The doctor would have either sought a private explanation, or furnished a detailed formula. With practitioners of the former class few pharmacist have any trouble, but any chance for controversy with the other class should be carefully avoided. In another case like this, "W." will doubtless think it prudent, in his own behalf, to do what he might better have done in this instance, viz., decline to put up a doubtful prescription. It rests with him to determine whether it is in his interests to ask the prescriber's assistance, or to refer the patient to him for more complete instructions.

The Committee on Entertainment.

This important committee of the American Pharmaceutical Association appears to have received rather more blame than thanks during the two years that it has been in successful operation We say *successful* advisedly; for notwithstanding the fault that has been found with its work, the fact remains that at none of the recent meetings of the Association have such excellent arrangements been made and executed for the entertainment of its members, with economy of both time and money, as have been the case since this committe went into operation.

All this has been done in spite of obstacles, for at Niagara, contracts made in apparent good faith were ignored on the slightest pretext, or for none at all, and the committee found itself almost helpless when it was too late to escape the maws of those human sharks. At Washington, the local committee chosen to co-operate with the Entertainment Committee persistently maintained a masterly inactivity in spite of urgent appeals to bestir itself, and it was not until almost the last moment, and after what would seem to be unnecessary exertion, that the committee succeeded in securing a change in the local committee, and expediting the preparations.

It is to be expected that no plan for the entertainment of so large a number of persons will exactly suit everybody, and it is rather remarkable, under the circumstances, that the committee has pleased so many. Next year, some of the important details are to be arranged by the Council, and it is to be hoped that, with the experience of the committee to guide them, they will be at least as successful as the committe has been while acting by itself. We fear, however, that unless caution is used, we shall have another illustration of the truth of the old saying: "Too many cooks may spoil the broth."

Correction.

In the article entitled: "A New Aspirator," on page 273 of our last number, the following corrections should be made:

First column, line 24, read "a column of water," instead "a volume of water."

Ibid., line 28, read: "As a mass falling from a given height exerts a certain amount of energy, in order to produce the same energy by falling from a lesser height, the mass must be increased."

Second column, line 14, read "bored" for "bared."

Fitch's Siphon Starter.

We have lately had submitted to us an ingenious and simple device for starting siphons, which bids fair to become a necessary adjunct to the outfit of every laboratory and place of business. The starter itself is illustrated in our advertising pages (see p. 67), and its mode of operais easily understood from the cut. By compressing the two parts of the apparatus over the rubber rollers, and rapidly drawing the whole apparatus down to the end of the rubber tube outside of the receptacle, a vacuum is created which is filled by the rising liquid. On now compressing the other end of the starter, the rubber tube is released from pressure, and the liquid will continue to flow until arrested. By hooking the extreme end of the upper portion under the ring (at the left) through which the tube passes, the siphon may be kept open without making pressure. A few trials made with a bottle or barrel containing water will teach the best manner of using the apparatus.

We have used it for some time past for all sorts of liquids which do not affect rubber or metal, and it has given us great satisfaction.

Compressed Tablets for Preparing Fehling's Solution.

Messrs. John Wyeth & Bro., of Philadelphia, have sent us a very compact and convenient case of test-agents for determining the presence and amount of glucose in diabetic urine, which is modelled after the test known as Fehling's. It is well known that in order to be at all reliable, Fehling's solution should be recently and carefully made; and it is so often the case that both these essentials are doubtful that the physician who has occasion to test urine for glucose fails to get the assistance that a good analysis could render him. The apparatus offered by Wyeth & Bro. consists of a small box containing a small pipette with a rubber bulb, and three small vials containing, respectively, sufficient caustic soda to make fifty minims of soda solution, twenty-five tablets of tartrate of soda, and the same number of tablets of sulphate of copper, the whole costing only forty cents, postage paid. Each package is accompanied with detailed instructions for use, and there is now no reason why examination of urine for glucose should not be as easy and customary as for albumen.

Precipitates in Fluid Extracts, Tinctures, Etc.

BY PROF. J U. LLOYD, OF CINCINNATI.

(*Concluded.*)

WE now arrive at a point where we can best introduce the fact that precipitates will and do form above the surfaces of our tinctures, and in continuing the study we shall call attention to a phenomenon which is familiar to all pharmacists, but which, perhaps from this very reason, escapes general investigation. It is not unusual for interesting every-day phenomena to escape our observation, or, if noticed, to scarcely receive the courtesy of a thought from us, and it may strike some as a useless waste of time when we call attention to the fact that around the inside of the bottle, and apparently on the surface line of most tinctures and fluid extracts, or similar solutions, there may be found a deposit of insoluble matter. This deposit may vary in height from a mere line to the quarter of an inch, and it may extend partially or entirely around the bottle. If a portion of the contents of the bottle be drawn off, the stopper replaced, and the bottle permitted to stand again, after a greater or less period of time it will be found that another deposit has occurred which resembles the first. This experiment may be repeated until the entire contents of the vial will have been abstracted, and with each fractional decrease of the surface of the liquid a ring of insoluble matter will remain to mark the position the surface occupied.

Upon close observation it will be found that this deposit is not directly upon the surface of the liquid, but is separated from it by the width of that amount of fluid which is attracted up the sides of the glass, and that the upper edge of the film of liquid barely reaches the lower edge of the layer of precipitate. In studying the formation of this deposit, it will be found that it presents itself first as a line along the edge of the film of liquid which is attracted up the side of the bottle, and that this line widens and thickens in time until finally it assumes the form of a deposit which may be made to grow many inches in width, and of considerable thickness. It will be observed that the growth is upward, and that it is usually, if not always, above the extreme surface of the liquid, even of that portion which is attracted by the side of the bottle.

Here we have a phenomenon which merits attention. The deposit will occur in closely stopped vials or in sealed tubes. It will proceed to form whether the liquid be fully or partially saturated with the solid, and it is not unusual to find the most characteristic precipitate (for it is a true precipitate) in dilute preparations such as ordinary tinctures. It must be remembered that tinctures and fluid extracts are not simple solutions of a single substance, but they are complex. Although the dilute solution of a very soluble salt will not produce a deposit, a certain amount of material being necessary in such instances, a tincture or fluid extract will usually contain some substance which may easily be thrown out of solution, and after this is once deposited it may be insoluble in the liquid which held it.

In explaining the afore-named problem, we desire first to call attention to the fact that such deposits of solid matter can only be formed from substances derived from the liquid, and that they may occur when the liquid which is placed in the bottle is a perfect solution and free from solid particles. They will form as quickly under these conditions as though the liquid contained undissolved particles of matter, and they are not therefore an aggregation of the solid particles which pre-existed in the solution. In explaining this phenomenon, we will repeat that it is well known that deposits will follow when solutions evaporate, and in studying the precipitate under consideration, we naturally assume that the precipitate resulted from evaporation of the liquid in the manner we have explained the formation of the scum upon the surface of the liquid in a closed vessel. However, the production of any considerable deposit would necessitate the evaporation of considerable liquid; and since we are now speaking of liquids in air-tight receptacles, it does not seem reasonable to suppose, from the ordinary view of the matter, that deposits of any considerable weight could have been formed in this manner. However, under favorable conditions, large amounts of solid matters have accumulated in small vials under our observation, and above the surface of the liquid, and it was demonstrated that they were formed by continuous evaporation.

In speaking of the film, which forms upon the surface of liquids in air-tight bottles, we referred to the fact that changes in temperature were followed by repeated evaporations and condensations, and now we speak of continuous evaporation and condensation. In order to explain the subject and uphold our argument, it is necessary to show that continuous evaporation and condensation progress under ordinary circumstances. The fact that such a phenomenon is taking place will be apparent to all who will revert to changes which constantly occur in our presence. Place a few pieces of camphor in a closed bottle, and place the bottle in the vicinity of a warm object where the temperature will be unevenly applied, the bottle being warmer on one side than it is on the other. In a moderate length of time it will be noticed that crystals of camphor will appear on the cooler portions of the inner surface of the bottle, those portions opposite the warm object, and these will increase in size and number until the entire surface of the cool portions of the bottle will be covered with a frostwork of camphor. Notice the camphor bottles on the shelves in our apothecary shops, and in cold weather it will be found that the surface which is exposed to the warm air of the room will be free from crystals, while that toward the wall (if an outside wall) will be covered. Pour a little water or alcohol into a bottle and place the bottle near a stove, or a steam-pipe where the heat is regular, and in a short time the inner surface of the bottle, opposite the warmth, will be covered with moisture. This deposit will increase steadily until drops of condensed liquid will form and trickle down the cool inner surface of the bottle, but during all of this time the warm side of the bottle will remain dry. This evaporation from the surface of the liquid, and the subsequent condensation, will continue during an indefinite period, and as long as the uneven temperature is maintained. Thus we have continuous evaporation and continuous condensation under circumstances which occur in most if not all of our stores, for it is almost if not always an impossibility to find a location where our bottles will be exposed to an even temperature on all sides. In following this line of investigation, in order to form an idea of the actual evaporation under these circumstances, we prepared three glass U tubes, all of the same sized tubing, one-half inch bore, and each arm was six inches in length. One of the arms of each tube was then filled with water and both arms were securely sealed. The tube was then inverted (curved part upward), and fastened in such a manner that the filled arm of each was against a thick piece of felt, which in turn rested against an upright pipe through which alcohol was distilling. By this means we obtained a regular temperature for both arms of each tube, the highest temperature being applied to the filled arm. In a short time the empty arm of each tube was moistened with condensed vapor, and in a moderate period of time it contained a layer of water. This increased in depth, and the water in the opposite arm diminished in proportion until the warm arm of each tube was empty and the other full. Self-registering thermometers fastened against each arm showed a temperature of 104° F. for the warm arm of each tube and a temperature of 94° F. for the cooler arms, or a difference of 10° F. One arm of a tube was then filled with alcohol, the arm of another with water, and the third with sulphuric ether. The tubes were fastened in a manner similar to the last experiment, in the positions previously occupied, and all were submitted to the conditions before recorded. In twenty-two and one-half hours all of the ether (six inches in depth) had passed from the warm arm into the cool arm. Ten-sixteenths of an inch of alcohol and five-sixteenths of an inch of water evaporated and condensed during the same period. Thus it will be seen that the rate of transference was governed by the boiling points of the liquids, and other experiments with other

liquids gave no variation to the rule.* We think that the foregoing experiments conclusively point to the fact that evaporation is constantly progressing from the surfaces of the liquids in our shop bottles, although we do not notice the result because the condensation which follows is in the same vessel with the evaporating liquid, and there is no change in surface level.

Let us now revert to the ring of deposit which we have said was formed just above the surface of the liquid. The creeping incrustation of our evaporating basin may be compared with it, and the explanation which has been advanced concerning the formation of the former will answer for the latter. Both are deposited by the evaporation of the solution, and both incrustations increase in height by the capillary attraction the deposit possesses for the liquid beneath. In continuing our investigations it will be found that causes which affect the deposition of this material on the sides of an open evaporating dish will also influence, and in like manner, the deposition of the deposit on the side of a closed vessel. Upon those portions of the dish where the temperature is greatest the largest amount of incrustation will form. If the bottle be placed in such a position that the heat will be upon one side, the incrustation will grow more rapidly within this portion of the bottle, and by applying the heat in a line from the bottom to the top of one side of the bottle, the deposit may be made to extend several inches above the surface of the liquid on that side of the bottle without appearing elsewhere. This fact is exemplified by the specimen which we present, A, whereby an eight-ounce glass-stoppered bottle was about half-filled with a saturated solution of chloride of sodium and then securely stoppered, and sealed with a rubber cap and then fastened against an upright pipe through which alcohol was distilling. In fifteen minutes a line of deposit appeared upon the inside of the bottle, just over the liquid, and against the pipe. This line increased in height, width and thickness until, when the bottle was removed (thirty hours) it was, as is shown by our specimen, two and one-half inches in height and two inches in width at the widest portion; it was oval at the top and cut off at the bottom by the surface of the liquid.

Specimens B, C and D show the deposit which formed in bottles containing severally tiacture of dulcamara, tincture of sanguinaria, and tincture of fucus vesiculosus. These bottles stood in an ordinary prescription case which was situated six feet from a stove, the back of the case toward the stove. It will be noticed that the incrustations appear on the sides which are opposite the label, and these positions were warmed through the back of the case by the stove. Thus we find that under conditions where the bottle is heated evenly, a deposit is likely to appear in a ring on the glass above the entire surface of the liquid. If the bottle is unevenly heated, however, as is often the case where our shelf bottles are exposed to a cold wall on the one side, and the warm air of the room upon the other, the deposit will likely be greater on the side opposite the wall. If, upon the contrary, the bottle be in a cool room and next to a flue or warm wall, the deposit is reversed and it appears next to the wall, in which connection we call attention to specimen E, wherein a securely stopped bottle of saturated solution of chloride of sodium was placed on a shelf against a flue. The deposit appeared upon the back of the bottle, as shown by our specimen.

In order to determine the amount of evaporation and of condensation in sealed vessels under circumstances such as we have named, exclusive of the experiments with the U tubes, we carried on several series, arguing that a comparison of the weight of the incrustation with that of the solid matter in the entire solution, would give the amounts of liquid which evaporated during the formation of the incrustation. The result demonstrated that the evaporation is rapid, and that large amounts of liquid volatilize and condense, especially when there is considerable difference of temperature between the sides of the bottle. As an illustration a bottle was half filled with alcohol and then a layer of iodide of potassium was placed in the bottom of the bottle. The stopper was replaced and the bottle sealed with a cap of rubber. The bottle was then placed near a pipe which contained distilling alcohol, and in a moderate length of time it was found that the incrustation above the liquid was of considerable height and thickness. This incrustation was removed, dried, and the weight shown to be 60.25 grains. The alcoholic solution was then weighed (1090.9 grains) and evaporated, showing a residue of 47.35 grains. In accordance with this determination, it would have required 1327.9 grains of alcohol to have dissolved the incrustation (60.25 grains), or nearly one and one-fourth times the entire amount of alcohol within the bottle.

There are some phases of precipitation yet to be considered, and which are closely related to those we have presented to this society during the past three yearly meetings. These are interesting within themselves, and would lengthen this paper beyond endurance were we to presume to introduce them at this time. It is also true that the precipitates which we have considered in this paper present some characteristics which we have neglected to mention, but rather than weary our members we shall defer their discussion until a future day.

During the discussion which followed the reading of this paper, at the late meeting of the Amer. Pharm. Association, Mr. Charles Rice remarked that he believed Prof. Lloyd to be on the track of very important new facts which would probably throw light on certain physical phenomena not yet thoroughly understood.

A member believed that he action of light was a frequent cause of precipitation Another member thought that chemical changes, usually not well understood, would account for many precipitates in fluid extracts; it having been remarked that tinctures, not being saturated solutions, were less likely to contain precipitates than are the more concentrated fluid extracts.

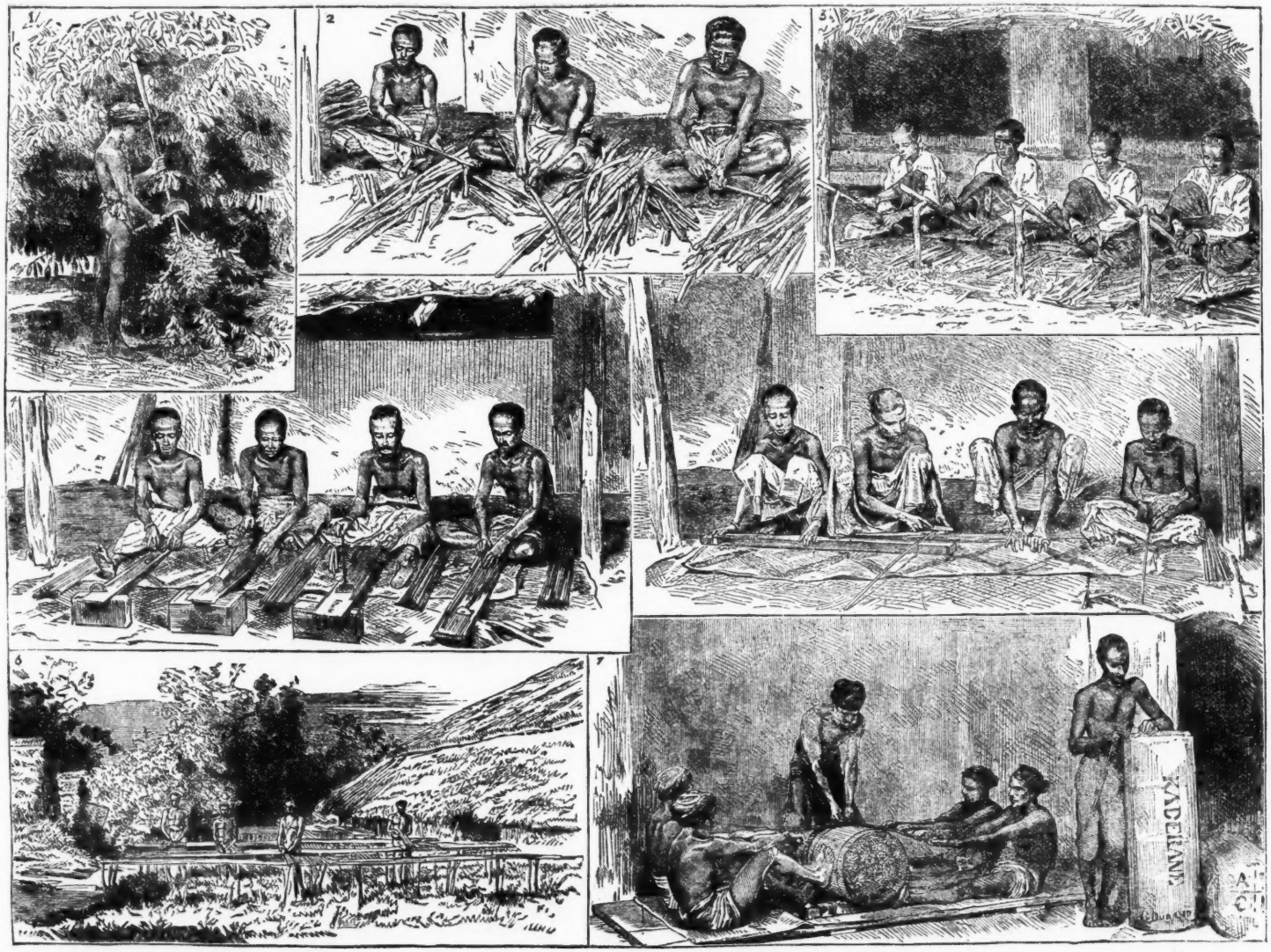
Mr. Lloyd stated that many tinctures were saturated, so far as certain plant constituents were concerned, and partially saturated solutions of other more soluble substances. The causes which led to precipitation in the fluid extract of a certain plant might or might not lead to precipitation in a tincture of the same plant.

Cinnamon Culture in Ceylon.

About 1770 De Coke conceived the happy idea, in opposition to the universal prejudice in favor of wild-growing cinnamon, of attempting the cultivation of the tree in Ceylon. This project was carried out under Governors Falck and Vander Graff with extraordinary success, so that the Dutch were able, independently of the kingdom of Kandy, to furnish about 400,000 pounds of cinnamon annually, thereby supplying the entire European demand. In fact, they completely ruled the trade, and would even burn the cinnamon in Holland lest its unusual abundance should reduce the price.

So determined were the Dutch to retain the monopoly in the produce of cinnamon that the plants were limited to a certain number, and all above that number destroyed, besides which large quantities of cinnamon, after having been prepared for market, were frequently thrown into the sea or burnt. It is recorded that on the 10th of June, 1760, an enormous quantity of cinnamon was wantonly destroyed near the Admiralty at Amsterdam. It was valued at eight millions of livres, and an equal quantity was burnt on the ensuing day. The air was perfumed with this incense; the essential oils, freed from their confinement, distilled over, mixing in one spicy stream,

*We cannot carry the result of this set of experiments farther without deviating from our subject. We may briefly note, however, that under all circumstances, where there is an uneven temperature below the boiling point of the liquid, evaporation progressed from the warmer side and condensation followed on the cooler. All that is required is a difference in temperature, and the condensing temperature of one experiment may be the evaporating temperature of another Where there was the greatest difference in temparature the most liquid was transferred. There is considerable food for investigation in this direction.



THE PREPARATION OF CINNAMON IN CEYLON.

1. Cutting Cinnamon sticks. 2. Peeling the sticks. 3. Stretching the cinnamon bark. 4. Cleaning the cinnamon on boards. 5. Cutting the cinnamon into lengths. 6. A cinnamon drying ground. 7. Tying the cinnamon into bundles for exportation.

which flowed at the feet of the spectators, but no person was suffered to collect any of this, nor on pain of heavy punishment to rescue the smallest quantity of the spice from the wasting element.

When Ceylon came into the hands of the English in 1796, the cinnamon trade became a monopoly of the English East India Company and it was not till 1833 that this monopoly was finally abolished, and the cinnamon trade passed into the hands of merchants and private cultivators.

A very heavy duty to the extent of a third or half its value was imposed upon cinnamon up to within so recent a date as 1853. At the present time by far the largest proportion, as well as the finest quality, is obtained from Ceylon, where extensive plantations exist.

The cinnamon tree, which is very variable in form and size, is known to botanists as *Cinnamomum zeylanicum*. It is very generally distributed in the Ceylon forests up to an elevation of from 3,000 to 7,000 feet. The best quality bark is obtained from a particular variety, or cultivated form, bearing large irregular leaves. The barks, however, of all the forms are very similar in appearance, and have the same characteristic odor, so that it is sometimes impossible to distinguish the best trees from appearance alone. It is not uncommon, indeed, for the cinnamon peelers, when collecting bark from uncultivated plants, to taste a small portion before commencing operations, and to pass over some trees as unfit for their purpose. On the southwest coast of Ceylon, on a strip of country some twelve to fifteen miles broad, between Negumbo, Colombo, and Matura, the best quality of cinnamon is found up to an elevation of 1,500 feet.

Sir Emerson Tennent states that the five principal gardens in the above district were each from fifteen to twenty miles in circumference. Owing, however, to the enormous extent of coffee cultivation, up to within the last few years, many of the cinnamon gardens have given place to coffee, which has since been so seriously devastated by the *Hemileia vastatrix*, that coffee-planting has in many plantations been itself abandoned.

The management of the cinnamon plantation has been described as similar to that of oak coppice in England. The plants are pruned to prevent their becoming trees, so that several shoots spring up, four or five of which are allowed to grow for a year or two At this period the grayish green bark begins to change color, and to assume a brownish tint. As the shoots arrive at the proper state of maturity, at which time they are usually from six to ten feet high, and from half an inch to two inches thick, they are cut down with a long-handled hatchet-shaped knife, known as a *catty*, as shown in Fig 1. The leaves are then stripped off, and the bark slightly trimmed of irregularities, the trimmings being sold as cinnamon chips. It is next cut through at distances of about a foot, and cut down also longitudinally; it is then very easily removed by inserting a small sickle-shaped knife, called a *mama*, between the bark and the wood.

After removal the pieces of bark are carefully put one into another and tied together in bundles. In this state they are left for twenty-four hours or longer, a kind of fermentation taking place which helps the removal of the outer bark. To effect this, each piece of the bark is separately placed on a stick of wood convex on one side, and by carefully scraping with a knife the outer and middle layers are removed. At the expiration of a few hours the smaller quills are placed within the larger, and the bark curling round forms a sort of solid stick, generally about forty inches long These sticks are kept for a day in the shade to dry, and then placed on wicker trays for final drying in the sun, as shown in Fig. 6, and when thoroughly dried are made into bundles, each weighing about thirty pounds (Fig. 7).

Notwithstanding that the cinnamon plant has been introduced into India, Java, China, Senegal, Brazil, West Indies, and other parts of the world, the bark imported from these places is deficient in aromatic qualities, and Ceylon cinnamon still holds its own as the very best quality brought into the market.

The quantity of cinnamon imported into England in 1881 amounted to 1,730,415 lbs., of the value of £121,176.

Our engravings have been made from photographs taken by Messrs. W. L. H. Skeen & Co., of Colombo, which have been recently acquired for the Museum of Economic Botany at Kew, and we are indebted to Sir Joseph Hooker for the loan of them.—*London Graphic.*

Purity of Iodide of Potassium.*

BY PROF. A. B. PRESCOTT.

I AM indebted to the Chairman of the Committee on Queries for the five samples I have examined, each of which came to me in an unbroken pound package, bearing the label of the manufacturer. Three of the samples were of American and two of European production. Of the latter, the one was British and the other was German. In sending the samples, Professor Lloyd called my attention to the fact that the European samples represented articles usually classed as "fine" or "chemically pure" goods, and sold at a price much higher than that of the American articles. Upon the manufacturers' labels, the American and British samples bore, with well-known names, no claim or specification as to the degree of purity or grade of use of the articles, but the German sample had the familiar inscription "Ph Germ." From the labels, then, it is to be understood that all the articles represented in these samples were put forth alike for medicinal use, the ordinary use of iodide of potassium, and without claim for any higher degree of purity than medicinal uses (or pharmacopœial specifications) require. The price-list of the German makers of pure chemicals, for analytical and special purposes, usually give two grades of "kalium iodatum," namely, Ph Germ. and puriss.; the latter article being priced only 3 or 4 per cent higher than the former. It is true that the article professing to be merely German pharmacopœial iodide of potassium is frequently furnished and used in this country as a chemically pure salt for analytical purposes, and from occasional trials of both these German grades during the past six or eight years, I can only say that the article marked purissimum is somewhat more likely to be fit for all uses of a chemical reagent than the article marked Ph. German, while even the former is often defective. Under the imprint puriss. I have less often found an alkaline reaction or the presence of iodate, but have frequently found chloride, and not rarely bromide. An article trustworthy as a reagent in all uses can only be obtained already made out of these grades by selection of lots upon special order; and cheaper grades than either of these are to some extent available for analytical uses by careful selection, it being not very uncommon to find a lot of American medicinal iodide of potassium that is at once neutral in reaction and free from appreciable traces of iodate, chloride, bromide, and sulphate. In view of their cost in this country it may well be claimed that the European articles represented in these samples are not in the market upon the same plane with the American articles. Nevertheless, we have to note that these European grades are in use. With present import duties, it appears that the cost of the European goods under consideration is about 100 per cent greater than that of the American goods; each being carried in the same quantities, sold as special goods upon small demand, the European articles cost from 130 to 150 per cent more than the American. In a late instance known to the writer, iodide of potassium, warranted chemically pure for use in analysis, and admissible to the country free of duty for scientific purposes, was obtained by importation at a rate 33 per cent higher than the rate for the standard medicinal salt of American manufacture, made for medicinal use in Europe. The query concerns only conformity to the test limits of the pharmacopœia. Our standard of measurement is the United States Pharmacopœia. Primarily we are to apply the tests of the United States Phar-

*Read at the meeting of the Amer. Pharm. Asso. in answer to Query 16: "Will Iodide of Potassium, of Foreign and Home Manufacture, answer the Tests of the Pharmacopœia? Which averages best?"

macopœia of 1880, and in the way of further inquiries, secondarily, we may compare tests of the United States Pharmacopœia of 1870, the current Br. Ph., and the new Ph. Germ. Also we may consult unofficial tests for their bearing upon pharmacopœial standards, and may ask discussion as to the right province of these standards. The pharmacopœial requirements are taken in order as follows, believed to be the order of their importance:

(1.) The absence of iodate. The aqueous solution of the salt mixed with gelatinized starch and afterward with diluted sulphuric acid should not at once acquire a blue color, absence of iodate, U. S. Ph. 1880. Its solution, mixed with diluted sulphuric acid and afterwards with solution of starch, gradually assumes a purple tint which at length becomes blue. When tartaric acid is freely added to a strong solution, the supernatant liquid, if mixed with solution of starch, gradually assumes a purple tint which at length becomes blue, U. S. Ph. 1870. The addition of tartaric acid and mucilage of starch to its watery solution does not develop a blue color, Br. Ph. The watery solution (1 to 20) mixed with diluted sulphuric acid on the addition of solution of starch should not at once become blue, Ph. Germ. (1882). The test is often made by adding a crystal of tartaric acid to the solution of the iodide to be tested. The results of a crystal of tartaric acid do not differ materially from those by dilute sulphuric acid, provided the latter be quite free from nitrous acid If in doubt as to the purity of the sulphuric acid at hand, the tartaric acid crystal may well be used. The test by color of the liquid without starch is but little less delicate, though not quite sufficient for the law. Of course the result hinges on the occurrence of the color at once, and in the Ph. Germ. test the acid is added with or immediately before the starch. Pure hydriodic acid, it will be remembered, exposed to air and in water containing air, very soon gives free iodine. All oxysalts of iodine, hypoiodite, (it having been inferred that traces of salt of hypoiodous acid sometimes result from atmospheric liberation of hydriodic acid, and impart a peculiar odor corresponding to that of the chlorinated compounds), as well as iodate, are revealed by the test and are fairly excluded by the requirement of the pharmacopœia. Practically the test is a close one, but does not effect an absolute exclusion of iodate when no regard is given to slight tints of the starch short of the blue color. Moreover, the test should not be applied in very dilute solutions. The German Pharmacopœia prudently specifies the strength of the solution (1 to 20). Biltz, *Notizen zur Pharmacopœia Germanica*, 1878, p. 181, found that in solution of 1 to 20 the addition of dilute sulphuric acid without starch gave a pale yellow color when only 0.1 to 0.01 per cent of iodate was present, while in much more dilute solutions as large a quantity as 0.5 per cent could be present before a full brown color was developed on addition of the acid.

Iodate of potassium is well known to be poisonous. Most reducing agents, including many organic bodies, liberate iodine from an iodate, and with help of an iodide all acids at once cause, as in the test, the liberation of iodine in amount six times that in the iodate—$5KI + KIO_3 + 6HCl = 6I + 6KCl + 3H_2O$. Even atmospheric carbonic acid gradually effects this change. And one part of potassium iodate with excess of iodide and with free acids, furnishes 3.5 part of free iodine. Free iodine as an impurity in the salt in hand or as a product in the stomach is alike objectionable. In one method of manufacture of iodide of potassium iodate is formed and afterward reduced. Also pure iodide exposed for an hour to melting heat acquires a trace of iodate and an alkaline reaction. Manufacturers are not likely to be so careless as to neglect the reduction of iodate when this is a considerable intermediate product of their process, but they may neglect needful precautions or additional work to remove final traces of this impurity, especially when only such traces are formed in the method employed. When potassium iodide is manufactured free from iodate, I do not believe this impurity is ever acquired by atmospheric action in keeping, even if in solution. The pure salt is not affected by the air when dry, and when moist is affected no farther than a possible very slight liberation of hydriodic acid, and then of free iodine with corresponding formation and preservation of alkali carbonate.

(2) The limit of alkalinity. Generally having a faintly alkaline reaction, but single crystals laid upon moistened red litmus paper should not at once produce a violet blue stain (absence of more than about 0.1 per cent of alkali, U. S. Ph. 1880. Produces no change in the color of litmus, and little if any in that of turmeric, U. S. Ph. 1870. It commonly has a feeble alkaline reaction. Its aqueous solution is only faintly precipitated by the addition of saccharated solution of lime, Br Ph. Crystals laid upon moistened red litmus paper should not immediately give a violet blue color, Ph. Germ. 1882. Giving a neutral or very slightly alkaline solution, not made turbid by lime-water, Ph. Germ. 1872. Biltz found that one-fifth per cent of potassium carbonate would cause a violet blue color to show at once upon placing a crystal upon wet litmus paper, while ½ per cent would give a pure blue color at once, and 1 per cent a deep blue color at once. Also that the lime-water test does not reveal less than one per cent of the alkali carbonate, when the solution is concentrated, and even more than one per cent will escape recognition when the solution is dilute. It is an easy test to determine the percentage of alkali volumetrically. In so doing, I prefer to weigh out 6.9 grams of iodide to be tested, and use decinormal solutions of acid and alkali, when each *cc.* of decinormal acid beyond that taken up by the decinormal alkali equals 0.1 per cent of potassium carbonate. Excess of the acid is first added from the burette, when the solution is quickly brought to boiling and immediately titrated back to neutral point with the decinormal alkali. With phenol-phthalein as an indicator, the number of *cc.* of acid required to take out the red color in presence of bicarbonate formed will be about one-half the number of *cc.* of acid required to keep the reaction acid after driving off the carbon dioxide. It may be assumed that, unless in some exceptional case, the alkali found is alkali monocarbonate. Some degree of alkaline reaction is a pretty general feature of medicinal iodide of potassium all over the world, and is accepted and now more definitely limited by the pharmacopœias.

Alkali in fraction of one per cent probably will not be objected to by the physicians, but it must be admitted that any alkali at all is liable to have inconvenient pharmaceutical incompatibility. Nearly all iodide of potassium offered as chemically pure is neutral in reaction whatever its other defects. A neutral iodide free from iodate, if kept moderately air-dry, will not develop free iodine from atmospheric action.

(3) The limit of chloride and bromide If 1 gram of the salt be dissolved in 10 *cc.* of water of ammonia (of 10%), then shaken with a solution of 1.1 gram of nitrate of silver in 30 *cc.* of water, and the filtrate be supersaturated with 7 *cc.* of nitric acid (*s. g.* 1.42), no cloudiness should make its appearance within ten minutes (absence of more than about 0.5% of chloride or bromide) U. S. Ph. 1880. Solution of nitrate of silver added in excess forms a yellowish-white precipitate which, when agitated with ammonia, yields by subsidence a clear liquid in which excess of nitric acid causes no turbidity, Br. Ph. The test required by the German Pharmacopœia of 1882 is that of our present pharmacopœia with all quantities just one-fifth as large, but with dilution to over twice as great proportional volume, while the time is the same and the limit is at opacity instead of cloudiness. The German test, therefore, is a little less stringent than ours. The various tests depending upon weight of silver precipitate obtained, or quantity of silver nitrate required for precipitation, or volume of a standard mercuric solution for reaction, all require very close operations upon the perfectly dried salt, and their results are worthless if there be more than one impurity or defect present. The effect of alkali carbonate counterbalances that of chloride or of sodium salt. Traces of chloride and bromide are very difficult to avoid in manufacture. A quantity of chloride larger than the limit ren-

ders the article deliquescent in proportion to its increase. But our present limit will no doubt be found close enough. The test limit admits more of bromide than chloride, but cannot admit enough of bromide to pass by proportions of intentional adulteration with this cheaper salt. If it be desired to test for bromide, the iodide may be precipitated by copper sulphate with a little ferrous sulphate or sulphurous acid, and the filtrate treated with excess of dilute fresh chlorine water, enough to oxidize any remaining iodide to iodic acid, when the test may be completed by shaking with carbon disulphide or chloroform for the yellow color of bromine.

(4) Limit of sulphate. On adding to 1 gram of the salt dissolved in 30 *cc.* of water 5 or 6 drops of test solution of the flame color shall be violet at first, a quite severe requirement, but sometimes justified by articles in commerce.

(7) Test for moisture. Drying to a constant weight at 100° C.

(8) Test for free iodine. The salt will be colored. A solution shaken in a test-tube with carbon disulphide or chloroform will impart a violet color to the subsiding layer.

(9) Test for nitrate. Precipitate with excess of silver sulphate solution, and test the filtrate with concentrated sulphuric acid and a crystal of ferrous sulphate for nitric acid. Adulteration with entire crystals of sodium nitrate has been noted in Europe.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
(1) For iodate :					
U. S. Ph. test solution, 1 to 20, with starch.	No color	Purple blue ..	No color....	No color....	No color.
" " 1 to 4 "	Purplish.....	Pale blue....	Purplish	Purplish. ...	Purplish.
Solution, 1 to 20 acid, without starch.....	Slight yellow.	Pale yellow ..	No color....	Pale straw color.	No color.
Result : comparison as to iodate (1st test) ..	Standard....	Hardly up to standard.	Standard....	Standard....	Standard.
	3	4	1	2	1
(2) For alkali :					
U. S. Ph. test, wet litmus paper	Deep blue...	Deep blue...	Violet blue..	Faint blue ..	Violet blue.
Solution of 1 to 2, with lime water.....	Precipitate	Precipitate...	No precip. .	No precip..	No precip.
Volumetric estimation of K_2CO_3	0.74%	1.84%.....	0.05%	0.24%	0.04%.
Result	Below standard.	Below standard.	Standard....	Hardly up to standard.	Standard.
(3) For chloride and bromide :					
U. S. Ph. test	Precipitation.	Precipitation.	Slight cloudiness at once.	Same.....	Cloudiness at once.
Test for bromine	Present ..	Same..	Same.... ...	Same.....	Absent.
Result	Not standard.	Same.....	Same	Same.....	Same.
Comparison	3	4	1.	2	1
(4) For sulphate :					
U. S. Ph. test, adding hydrochloric acid ...	Cloudy in 5 min.	Precipitation.	Same.....	Cloudy in 5 min.	Clear.
Result	Not quite ...	Not standard.	Same.....	Nearly standard.	Standard.
Comparison	3.....	4.....	5.....	2.....	1
(5) For cyanide :					
Ph. German test	No cyanide..	Same	Same.....	Same	Same.
(6) For sodium salt:					
Ph. German test, 1, flame color...	Yellow	Same.....	Same.....	Violet	Yellow
U. S. Ph. identification of potassium... ...	Potassium ...	Same.....	Same.....	Same.....	Same.
(7) For moisture :					
Loss at 212° F. (100° C.)	1.4%	1.3%..... ...	0.6%..... ..	0.8%..... ..	0.4%.
(8) For free iodine :					
The solution with carbon disulphide	None	Same	Same..!.....	Same.....	Same.
(9) For nitrate in filtrate :					
From silver precipitate	None	Same.....	Same.....	Same.	Same.
(10) Sensible properties:					
Color	White ...	Same.....	Same	Same.....	Same.
Odor	Distinct odor.	No odor.....	Faint odor...	Same	None

nitrate of barium, no immediate cloudiness or precipitate should make its appearance (limit of sulphate), U. S. Ph. 1880, 20 *cc.* of a watery solution (1 to 20) with 10 drops of barium nitrate solution should not become turbid in five minutes, Ph. Germ. 1882. If the salt has been found alkaline, a drop or two of hydrochloric acid is to be added.

(5) Test for cyanide. The solution (1 to 20), with a fragment of sulphate of iron and a few drops of ferric chloride solution, warmed with addition of solution of soda, should not give a blue color on supersaturating with hydrochloric acid, Ph. Germ. 1882. A possible impurity carried through the manufacture from the iodine.

(6) Test for sodium salt. The U. S. Ph. and the Br. Ph. only demand identification as potassium salt by precipitation of the tartrate. The Germ Ph. specifies that

(10) Test by insolubility in alcohol. One gram of the dried and fairly pulverized salt is digested with 18 *cc.* of alcohol (90%) in a stoppered test-tube at ordinary temperatures, frequently shaking for several hours. Sulphate, carbonate, iodate, nitrate, and even much bromide, if present, will remain undissolved. The operation serves only to show gross adulterations, and any residue found must be tested qualitatively. If absolute alcohol be taken, not less than 40 *cc.* must be used, and the action is slow and unsatisfactory.

The foregoing summary presents the results of the tests, designated according to detail, already given as numbered. The observations were taken across a test-tube of the width of two centimeters—a little more than three-fourths of an inch—in the tests (1), (2) with lime water (3), (4),

and (5). In tests (1) without starch, the same results were obtained with diluted sulphuric acid and with a crystal of tartaric acid. In tests (4) the U. S. Ph. tests were supplemented by adding hydrochloric acid because of the alkalinity found in some of the samples, and to make the test uniform for all. Numbers 1, 2, and 3 were the American samples; numbers 4 and 5 were the European samples.

These samples of home manufacture furnish a very small, but, I believe, a fair representation of the medicinal iodide of potassium of this country. Different lots of the salt, as put out by any one of our American manufacturers at different times, will certainly differ from each other materially, and perhaps differ as much as do the several samples in this examination. By taking a greater number of samples, truer averages can be obtained, and no comparison between the goods of different manufacturing houses should be based wholly on one or two samples from each, or on samples taken at one time. Of the foreign samples, I can only say that they are single instances of the pharmacopœial salt as put forth by foreign makers of high standing. It will be seen that one of the three American samples stands fully as well as the average of the European samples, and a little better than one of them. I do not present the results of tests of these few samples alone as giving conclusive answer to the latter clause of the query or full answer to the first clause of it. But I have no information to oppose to the bearing of these few examinations, and have had a little experience, before mentioned, going to support the results here found. Therefore, I believe that it will be found that a buyer must exercise some selection in lots in order to obtain the medicinal salt of this country in as good a degree of purity as the average imported pharmacopœial article.

None of the pharmacopœial deficiencies found are very grave in character. In the most important medicinal requirements, the absence of iodate or of more than traces of it, one of the samples is just upon the U. S. Ph. test limit, and the others are standard (though No. 1 does not stand very strong in this test). In the limit of alkali, a requirement of less medicinal than pharmaceutical importance, the pharmacopœias have been very lax. Two samples are below the exact standard, and one just upon it. The limit of chloride and bromide is one more difficult for the manufacturer to control, and a margin beyond this limit is less injurious. Here none of the samples quite meet the U. S. Ph. standard. In the cases of Nos. 1 and 2, the presence of chloride, though probably not over 1 to 1¼% of the salt, had doubtless been the cause of the larger access of moisture found in test (7), and had thereby diminished the chemical stability of the salt. In Nos. 3, 4, and 5, the slight proportions of chloride and bromide beyond the limit may well be passed as not important. Most of the samples were found, also, with too much sulphate. This completes the list of the pharmacopœial deficiencies.

It is certainly desirable that our medicinal iodide of potassium should be so far improved as to be made uniform with its best portions, these being already nearly or quite conformable to the requirements of the pharmacopœia, especially in the important features of absence of iodate and close limit of alkali, the standard for which (fixed by the simplest possible of tests) may well be looked after by purchasers. Indeed, the manufacturers need the encouragement of an intelligent appreciation to enable them to eliminate deficiencies from their products. It is asking much of the honor and sagacity of men that they should devote care and capital to provide grades of purity never to be recognized by one in a hundred of the consumers. It is leaving a good deal to the manufacturers that it should ever be their part to stimulate a demand for sounder qualities of their products.

Medicinal chemicals may be tested and valued with more readiness and certainty than most other articles of commerce. The wardens of their consumption are the dispensing pharmacists. A demand for strictly pharmacopœial chemicals, an intelligent, healthful, steady demand, if it comes at all, must come through the avenues of daily trade from dispensing pharmacists who habitually apply their own tests, value their own purchases, verify pharmacopœial standards, and know their own business. Such a good demand will cause the distinctions of pharmaceutical purity to be attentively regarded by every class of dealers. With such a demand, the manufacturer is admonished that he may make expenditures needful for standard products.

Professor Remington, of Philadelphia, stated that carbonate of potassium was intentionally left in the liquors in order to insure larger crystals.

Professor Maisch stated that carbonate of potassium also rendered the crystals opaque, and while this appearance was not desirable, inasmuch as it indicated impurity, it was insisted upon by most buyers. He stated that an attempt was made in England, some years ago, to introduce a much purer iodide into the general market, but the result was disastrous.

Mr. H. B. Parsons, of New York, stated that similar attempts to sell a purer iodide in this country had resulted in the rejection of nearly every pound sold. This was partly due to the semi-transparent appearance of the crystals, and partly to the fact that the presence of even small amounts of potassium chloride in these crystals caused them to attract moisture, and then give off slight traces of iodine when exposed to the air. It seemed best to allow some carbonate, thus, perhaps, preventing somewhat the liberation of iodine, but the amount of carbonate should be very small, and be limited by a strict pharmacopœial test requirement

Professor Markoe, of Boston, called attention to the fact that iodide of potassium was frequently ordered to be dispensed with syrup of iodide of iron, and that a clear mixture should result. The presence of carbonate of potassium, as an impurity in the iodide of potassium, caused a troublesome precipitation of a portion of the iron salt.

In answer to Professor Remington, Professor Prescott stated that the samples of iodide examined were of fair quality, but that pharmacists ought to demand a better article. He called attention to the fact the crystals from successive mother liquors became more and more impure, and that nothing but careful, but not difficult, tests of each lot could be depended upon as evidence of purity.

Mr. Shinn, of Philadelphia, believed that if colleges of pharmacy, and individual customers would demand a better article, the manufacturers would furnish it.

Professor J. U. Lloyd, of Cincinnati, and Mr. Charles Rice, of New York, drew attention to the danger that serious results might follow the admixture of soluble salts of the poisonous alkaloids with iodides or bromides having an alkaline reaction. A considerable portion of the poisonous alkaloid might be thrown out of solution by the alkaline carbonate, and the sediment which might be given in a single dose would be likely to contain an excessive amount of the poisonous alkaloid.

Professor Markoe stated that the appearance of the crystals of iodide of potassium should not be relied upon as an evidence of purity, but that pharmacopœial tests should invariably be applied.

Mr. Charles Rice stated, on behalf of the committee that revised the Pharmacopœia, that the obstinacy with which the opaque variety is demanded by the public is so great and irresistible, that the pharmacopœia committees both of this country and of Europe were actually compelled to recognize and sanction its use, limiting, however, the impurity to a minute quantity.

Conium Substitutes.

HERR MADER, of Culmbach, reports in the *Pharmaceutische Zeitung* (Bunzlau), that a parcel of this season's conium herb he examined consisted entirely of two other common umbelliferous plants, *Anthriscus sylvestris* and *Chærophyllum temulum*, without a trace of conium. Suspicion was first aroused by the hay-like, not mousy, odor produced when a portion was boiled with caustic soda.

India-Rubber or Caoutchouc.

In consequence of the great demand, of late years, for India-rubber or caoutchuc, a considerable amount of attention has been given to discover or develop new sources of this useful article, some of which promise to be productive of valuable results. The time is not so very long since when India-rubber of commerce was obtained only from one plant, and that plant the *Siphonia elastica*, as it was then called, but which is now known as the *Hevea brasiliensis*, and which yields what is known in trade, at the the present time, as Para-rubber, a quality which holds its own for superiority over all others of the numerous sources from whence the elastic gum is obtained. In consideration of the great and increasing value of India-rubber, it may not be out of place to sketch the history of the substance from its introduction into this country, at the latter end of the last century. In the preface of a work treating on the art of perspective, published about 1770, we find the author thus speaking of that which is now an accessory to every ink-stand: I have seen a substance excellently adapted to the purpose of wiping from paper the marks of a black lead-pencil. It must, therefore, be of singular use to those who practise drawing. The writer then goes on to state where it could be procured at that time, which was apparently at only one place in London, and the price was three shillings for a "cubical piece of about half an inch," which, he adds, will last for several years The form in which Para-rubber was formerly brought to this country, was alone sufficient to arouse a curiosity as to its origin.

Caoutchouc made its first appearance among us in the well-known grotesque figures of birds and animals, which were not by any means true to nature. No information, however, could be elicited, for several years, as to its origin other than that it was a vegetable product. The first accurate information was obtained by a French geographical expedition, which, not confining its attention merely to the purposes for which it was organized, cleared up many other difficult points connected with natural history. These observers reported the discovery of great numbers of trees known to the natives as the heve, which yielded a large quantity of an elastic, gummy substance, identical with the caoutchouc which had been imported into Europe some years previously. The India-rubber of commerce is now, however, as we have before said, furnished by many plants totally distinct from each other, and though a great deal has been done, of late, to clear up the nomenclature of many of them, there are others still that are but imperfectly understood. The Para-rubber, which has been imported in such large quantities that the supply has been getting scarce for some years past, is furnished by *Hevea brasiliensis*, though several other allied species, such as *H. spruceana*, yield rubber more or less abundantly. Wallace tells us that the principal caoutchouc district lies between Para and the Xingui river, the trees being among the largest denizens of the neighboring forests. They average about one hundred feet in height, and two or three feet in diameter. The tree bears a fruit about the size of a large walnut, divided into three one-seeded lobes, which separate or split annually when ripe. The seeds are mottled and shining on the outside, and are similar in shape and appearance to those of the castor oil, but much larger. They are said to be poisonous when raw, but quite harmless when boiled. The Macaws, however, devour them greedily in their raw state without experiencing any harm The tapping of the trees and the collection of the caoutchouc have been so often described that it is needless to enter upon it here. In tapping, however, it may be remarked that the first wounds are always made at the uppermost part of the trunk, by which means the juice is drawn off down to the point of incision, after which another wound is made lower down, and exhausted, and so on until the base is reached. Perhaps the next most important of American sources of rubber is *Castilloa elastica*, a plant closely allied to the bread-fruit tree, and known as the Central American or Guatemala rubber-tree; then comes the Pernambuco rubber, from an apocynacious tree (*Hancornia speciosa*), an order which, besides producing Borneo rubber, has recently revealed many rubber-yielding plants, not only in the East, but also in Africa, both on the East and West-coasts. The eastern plants are referred to species of *Willughbeia*, *Luconotis*, and *Chilocarpus*, and the African to various species of *Landolphia*, the principal West-coast species being *L. owariensis* and *L. florida*, which last species also extends to the East-coast, the other East-coast species being *L. Kirkii* and *L. petersiana*. The careful cultivation and distribution of any of these plants is a matter of great commercial importance, and we are pleased to direct the attention of planters to our advertising-columns, where, among new commercial plants, those yielding India-rubber have a prominent place.

Preservation of Butter.

BY W. HAGEMANN.

The peculiar smell and taste of rancid butter is generally assumed to be due to the presence of free butyric acid, of which only a very small quantity is required to give fresh butter similar properties to those of rancid. In approaching the question as to the origin of the free acid, two theories present themselves: either it arises from a butyric fermentation at the expense of the lactose or glycerol, or else is the product of chemical changes, and is set free from certain glycerides in the butter. In carrying out experiments suggested by the former of these views, bacteria were obtained from a mass of cane-sugar undergoing butyric fermentation; these were introduced into quantities of pure butter fat which had been washed and freed from water, salts, and lactose; nutriment was added in the form of lactose and ammonium, and other salts necessary for the growth of the cells. The conditions of experiment were varied greatly, but in no instance was the fat turned rancid, even after standing many weeks; and the addition of a small quantity of rancid to fresh butter did not appear to accelerate the process. Analysis also showed that the quantity of glycerol in fresh and rancid butter was as nearly as possible the same; hence the presence of free acid could not arise from a decomposition of the glycerol. From these facts, the author concludes that the rancidity of butter is not due to butyric fermentation.

In testing the reaction of fresh and rancid butter with litmus-paper, it was noticed that the former gave reddish spots in all cases when the cream from which it was prepared had become sour, owing to lactic fermentation of the milk-sugar; rancid butter, however, gave in all cases a most powerful reaction. About half a per cent of undecomposed lactose is contained in fresh butter, and its fermentation appears to proceed further as the butter becomes rancid. The question then suggested itself whether this rancidity was not actually due indirectly to the lactic acid formed, and the action of this on fresh butter was therefore studied. Experiments made at the close of autumn showed that fresh butter, when mixed with lactic acid, becomes rancid very quickly, and at a temperature too low for the growth of bacteria. Pure butter fat was dissolved in ether, a few drops of lactic acid were added, and the whole allowed to stand over night. The ether was then driven off at a low temperature, and the residual fat proved to be strongly rancid. In order rightly to comprehend these results, the action of lactic acid on mono- and tri-butyrin was studied, and it was found that butyric acid was in every case set free, as shown by its smell and reaction with litmus-paper, the amount varying with the temperature, and being greater with tri- than mono-butyrin. These results indicate that the rancidity of butter is due to the formation of lactic acid by a process of fermentation from the milk-sugar contained in the butter.

The liability of butter to become rancid might be prevented either by removing the glycerides of the volatile acids, by creaming milk fresh from the cow with the addition of a small quantity of caustic soda, or by removing the milk-sugar itself; but at present no successful practical methods of performing either separation have been de-

scribed. Washing with water gives a tolerably stable product, but, if pushed too far, the aroma is lost. The ferment which acts on the lactose appears to be organic, and not a chemical ferment, such as diastase, myrosin, etc., as its activity is entirely restrained by chloroform. The amount also of acid formed does not vary with the quanity of the ferment, and increases, instead of diminishing, the longer the ferment remains in the lactose solution. This behavior can only be due to the presence of some organized bodies which increase in numbers as the fermentation proceeds, the amount of acid increasing in like proportion.—*Landw. Versuchs-Stat.*, 28, 201.

Fitch's Ureameter.

MR. G. C. HODGE, of Utica, N. Y., has favored us with the description of a modification of the apparatus for the hypobromite test for urea, which is in many ways an improvement upon any of the appliances yet described, and is calculated to render this important branch of medical chemistry much more available for physicians who have little time to devote to other and more complex methods. The so-called hypobromite test is now acknowledged to be as free from errors as any that are of practical utility, but the necessity of working with fresh solutions, the irritating character of the vapor of bromine, and the time required for its manipulation, have prevented its very general use. In former numbers of NEW REMEDIES are described various modifications of the apparatus, and through the courtesy of Mr. Hodge we are able to illustrate the one here referred to.

The tube V having been attached to the burette B with rubber bands and burette fixed in the holder, the latter is lowered into a tumbler of water until it nearly touches the bottom. By suction through the tube T, the burette is filled with water, and the pinch-cock P is then closed. Into the bottle L is placed 10 cubic centimeters of hypobromite solution made by adding 2.5 *cc.* of bromine to 50 *cc.* of solution of soda (liq. sodæ) - enough for five tests, or (and this is one of the features of this apparatus) 10 *cc.* of solution of soda made by dissolving 40 grams of caustic soda in water until the whole measures 200 *cc.*, and a glass pearl or globule containing about .5 *cc.* of bromine. The pearl having been broken and the bromine and soda solution thoroughly mixed, 2.5 *cc.* of urine are placed in the small test tube, any excess being removed with absorbent cotton wrapped on the end of a rod. The test-tube is then to be carefully placed in the bottle without spilling its contents and the rubber-stopper inserted, the pinch-cock C being open. Then close the latter, and taking the bottle in the holder H, it is inclined until the urine in the test tube is turned out and mixed thoroughly with the test-solut on. Gas is at once evolved, and passing through the tube V, enters the burette, displacing an equivalent amount of water When all evolution of gas has ceased, the figures on the burette will, without further calculation, indicate the parts of urea in 1,000 parts of urine.

Before another estimation, the burette should be lifted above the level of the water in the tumbler and the pinch-cock be opened so that air can be blown through the burette. The burette and glass can then be filled with fresh water, and the operation be repeated with another sample of urine.

At present these bromine pearls can only be obtained of the manufacturer, Mr. Hodge, at a cost of three cents a piece, by the dozen. He anticipates being able soon, however, to furnish them for half a cent less, each.

The saving of time and mathematical calculation in using this apparatus and the small liability to derangement of parts, are items worthy of special notice, as well as the fact that by reversing the burette it is capable of being used for other purposes.

Petrolatum in Officinal Ointments.*

BY PROF. J. P. REMINGTON.

[Concluded from p. 299.]

Unguentum Stramonii (Stramonium Ointment).

Extract of stramonium, 10 parts; water, 5 parts; petrolatum, 85 parts. Rub the extract with the water until uniformly soft, then gradually add the petrolatum and mix thoroughly. Very much preferable to the officinal in the treatment of hemorrhages.

Unguentum Sulphuris (Sulphur Ointment).

Sublimed sulphur, 30 parts; petrolatum, 70 parts. Rub the sulphur with the petrolatum, gradually added until they are thoroughly mixed. Probably no better than the officinal.

Unguentum Sulphuris Alkinum (Alkaline Sulphur Ointment).

Washed sulphur, 20 parts; carbonate of potassium, 10 parts; water, 5 parts; petrolatum, 65 parts. Rub the sulphur with the carbonate of potassium and the water, gradually add the petrolatum and mix thoroughly. Preferable on therapeutic grounds to the officinal.

Unguentum Veratrinæ (Veratrine Ointment).

Veratrine, 4 parts; alcohol, 6 parts; petrolatum 96 parts. Rub the veratrine with the alcohol in a warm mortar until dissolved. Then gradually add the petrolatum and mix thoroughly. This ointment is much darker in color than the ointment formerly officinal, due to the complete solution of the veratrine. When made from petrolatum it is probably more efficient than when made from lard, because of its more rapid absorption.

Unguentum Zinci Oxidi (Ointment of Oxide of Zinc).

Oxide of zinc, 20 parts; petrolatum, 80 parts. Rub the oxide of zinc with the 20 parts petrolatum previously melted, until the mixture is perfectly smooth, then add the remainder of the petrolatum and mix thoroughly. This ointment does not equal the officinal in appearance. It is not white, nor does it have the pleasant balsamic odor due to the benzoin, but where used to allay irritation, as

* Read at the meeting of the Am. Pharm. Asso.

in acute eczema, the ointment made from petrolatum will frequently be preferred.

The statement having been made by Professor Remington, that certain of these ointments made from petrolatum were more readily absorbed than were similar ointments in which lard was used, Mr. R. W. Gardner, of New York, inquired whether this statement had not been denied by prominent physicians.

Mr. C. T. George, of Harrisburg, Pa., stated that his observation had led him to believe that those ointments which are useful for their surface action are best made from petrolatum, while those intended for absorption do not give satisfaction when petrolatum is used.

Mr. Gardner mentioned the medicinal oleates, now so largely used by dermatologists, as probably the most valuable preparations where absorption is desired.

Who is Responsible for Adulteration?*

BY ROBERT H. COWDREY, PH.G.

THE query, "Is it desirable that pharmacists be held personally responsible for the quality of the goods which they dispense?" is seemingly but another way of putting the question of who is responsible for the adulteration of drugs?

In order to answer this question intelligently, it will be necessary to look for the causes of adulteration. In every case in which the writer has approached the wholesale dealer on this subject, the reply has been, "We have to supply adulterated drugs because the trade demand them; they so demand when they ask us to furnish them drugs at a lower price than the prime or unadulterated article can be sold for. They tell us the price they will pay, and we furnish an article as pure as can be had for that price." One member of a prominent firm stated that no firm could live that would sell only strictly pure drugs. This is the case as represented by the jobber.

The retailers are divided in opinion, the same varying in proportion to the character of the men. The majority, however, say that, if they could obtain pure drugs by paying more than the market price, they would willingly do so; some others, and I am pleased to say but a small proportion, will purchase the cheapest drugs from the cheapest house. The lines of contact between these two classes of retailers are very sharply defined, and but few members are numbered outside of these two classes. The class that would pay more for pure drugs may be rightly termed pharmacists; the other, druggists. As it would manifestly be unfair to hold the whole number responsible for the actions of the few, even though admitttng their presence in the body, I will only refer to the pharmacists.

The probability is that the whole truth is not told in either the case of the jobber or retailer; in the case of the jobber, for the reason that competition with his neighboring jobbers is as great an inducement for him to sell adulterated drugs as is the demand of the retailer for them; and that many drugs are sent to the retailer that are not pure, where pure was ordered, and for which the price of pure was paid.

As an illustration, take the case of the samples of powdered rhubarb examined by Geo. W. Hayes for Messrs. Allaire, Woodard and Co.'s prize: the price ranged from thirty-five cents to one dollar per pound, the prices paid, in the opinion of Mr. Hayes, bearing no relation to the purity of the drug, the jobber in each case representing the drug as being pure, strictly pure, or guaranteed pure.

In the case of the retailer, while he may be willing to pay more than the market price for pure drugs, he demands stronger proof for their purity than the simple advance in price. In the majority of cases, the expressed opinion was that, whatever the price paid, the drug always came out of the same barrel. I also find that there is not one retailer but who desires to get his drugs at the very lowest price at which they can be obtained. So much for the causes of adulteration. Now let us find who does the adulterating, and in order not to make this paper too lengthy, I will use the word adulteration as applying to only those cases in which the drug is reduced below the standard strength, with intent to defraud.

The drug-miller does some; the jobber, we are led to believe by his argument, "that he has to," does some; and, in some other cases, the retailer does some. There then are three guilty parties, and all equally so.

The law, as I am informed, would hold the one of these three in whose possession the adulterated article was found. But this query extends beyond this, and asks if the retailer should be held responsible for the quality of the drug he sells. I have shown that, in case of his being guilty of the adulteration, he not only should be, but under the law he is held responsible. In the case of his purchasing an adulterated drug, knowing the same to be so, he is liable under the law, and justly so. I am of the opinion, though not certain, that such is the case that, having so purchased, he would be held solely liable for the adulteration as against the one from whom he purchased.

In case he orders and receives what he believes to be a pure drug, and it is found to be an adulterated one, is it desirable that he should be held responsible for its quality? The answer is: No. And this answer is further supported by the law, as is shown by the case of Mr. Henry Fuller, who was tried on the charge of selling adulterated cream of tartar. This so-called cream of tartar contained about ninety-five per cent of terra alba and five per cent of tartaric acid. He was convicted and fined. Mr. Fuller appealed to the Supreme Court. Judge Cowing, in summing up the evidence in this case, made the following statement and decision: "There is no positive and direct evidence that the defendant was guilty of any criminal intent or culpable negligence in selling the cream of tartar. On the contrary, the unavoidable conclusion is that the defendant was desirous of obeying the law, bou ht the cream of tartar in the open market, paid the highest price, and asked for the best article. The evidence falls very short of making the defendant a criminal. I think the judgment of the Special Sessions should be set aside, and it is so ordered."

Judge Cowing afterward said: "If the Board of Health is desirous of following up this line of investigation, I think the manufacturers should be directly attacked. When a man buys packages of goods in the open market from a reputable dealer, and pays the highest price, he cannot, I think, justly be held for selling adulterated goods with criminal intent."

We see, in this case, where it is admitted that the article was sold as a medicine or food, the selling admitted, and it proved that the article was adulterated, that a complete defence was buying in the open market, asking for the best article, and paying the highest price.

If we take the position that the query asks: Is it desirable that the pharmacists be held liable, in order to force the pharmacist to become educated, so that he can detect adulterations in drugs that are sold to him for pure? the answer must be: No. In the first place, the penalty is too severe for the benefit sought; and secondly, it is impracticable, as the time consumed, even granted that the ability is not wanting, in examining each new lot of drugs would be all out of proportion to the annual income of the pharmacist. In the opinion of the writer, there is not a pharmacist or chemist in the world that could enter a retailer's store and correctly report on the purity of his drugs. If this is true, then certainly it is folly to ask that all pharmacists should be able to test the articles entering their doors. The best that can be hoped for is that pharmacists will voluntarily so educate themselves as to be able to detect the grosser frauds.

A very common article in each drug store is lard, and yet, in the recent reports of chemical analysis of twelve samples of lard, the composition and adulteration in each sample of which was known, we find that the chemists reported that eighty-five per cent of lard and fifteen per cent of tallow was pure lard; that eighty per cent of lard, ten per cent of cotton-seed oil, and ten per cent of tallow was

* Read at the meeting of the Amer. Pharm. Assoc.

pure lard. One chemist found beef-tallow in the pure lard and cotton-seed oil where there was none, and failed to find cotton-oil seed where there was some, the only one that came anywhere near the truth being one who confessed his inability to analyze four of the samples, and reported traces of cotton-seed oil in one sample that did contain some.

The writer was favored with the opportunity of witnessing part of this work, and if he had depended upon the confidence with which results were reported as the work progressed, he would have been led to believe that chemistry in the hands of experts always produced reliable results.

I think the foregoing is sufficient to show that a pharmacist should not be held responsible for adulteration upon the report of a chemist, unless the chemist's ability had been tested by samples of known composition being submitted to him to report upon at the same time as the suspected article. I therefore answer this query by saying No, and believe with Judge Cowing, that if adulteration is to be punished, the manufacturers, or any one else who adulterates, should be the one who is held responsible.

The man who knowingly adulterates human food, drink, or drugs is an enemy to his race, and should be treated as such. He is simply a human wolf, fattening upon the bodies of his fellows, and deliberately poisoning them for the purpose of making his own vile existence a little more comfortable.

Laboratory Notes.*

BY WILLIAM M. THOMSON.

SECTIONAL DISPLACEMENT.

DURING an experience of many years manufacturing largely fluid extracts, etc., for different establishments, I scarcely know of any part of the operation which is the source of more trouble, delay and annoyance than the recovery of alcohol from exhausted drug-tissue, and which is a matter of absolute necessity, few drugs affording better examples than buchu No. 60, senna No. 50, squills No. 40, fine. It is customary with some, in cases like this, to loosen up the packed drug with a large fork just before applying the water; others again employ the percolator, throwing the mass loosely into a larger vessel, and there displacing it. Either of these plans are good in their way, but are laborious, tedious and cause, especially the last one, a serious loss of that very article which they are endeavoring to save, namely, the alcohol, and consequently cannot be recommended.

To overcome, in a great measure, these difficulties, I, at one time, had made a percolator *in sections*, like the diagram here shown, and found it to operate well, each section having a diaphragm. The drug is packed therein to within two or three inches of the top, permitting a layer of liquid being constantly on the surface of the drug. When the drug has yielded the requisite amount of fluid extract, and it becomes necessary to displace it with water, the advantages of its somewhat peculiar construction are clearly shown, it being only necessary to remove each section after thorough depletion by the water, and thus reduce very materially the amount of substance to be operated upon, the sections as they are emptied can be used to build up, so to speak, another percolator in which to place another drug. This method I prefer to call "Sectional Displacement," in contradistinction to "Fractional" or "Repercolation."

When made upon a large scale and operating upon large quantities of drug, it has this advantage also, that in case at any time the flow of percolate should, from any cause, cease, any section can be withdrawn, and if found to be the one at fault, repacked and replaced in a short time without necessitating the removal or disturbance in the least of the balance already packed, and percolation resumed satisfactorily.

* Read at the late meeting of the Amer. Pharm. Assoc.

RICE-HULLS AS PACKING MATERIAL.

But to return to the previous subject—various articles have at different times been proposed to obviate this difficulty—sand, coarse gravel, sawdust, chopped straw, etc., —all of these have been tried with more or less satisfactory results, but none have rendered more solid satisaction than the article to which I would now be pleased to call your attention, and which I trust others will be induced to give a trial when a favorable opportunity presents itself—the material alluded to being rice hulls, or rice chaff, as it is sometimes called. Not susceptible of being acted upon by either alcohol or water, it may well be considered an inert substance. Water, cold or boiling hot, does not soften it or cause it to swell, and even steaming it exerts no influence whatever upon it. Consequently for those who possess large dreg stills, into which free steam in jets is blown, it promises to be a very desirable article, as it can be intimately mixed with the several lots of finely ground drug residue before being placed in the still, when it will be found to greatly facilitate the operation of recovering the alcohol contained therein, by keeping the steamed mass in a much more permeable and divided condition than could otherwise be done. Ground say No. 16 or No. 20 fine, and mixed thoroughly with any No. 60 or No. 80 powder, to be displaced with a weak menstruum, it will be found of much value, especially so when the time comes for displacement by water.

The method adopted by me in the manufacture of fluid extracts, being that in which the drug is subjected to great pressure upon the lower diaphragm, it became a matter of much concern as to what inert suitable substance could be satisfactorily placed thereon to sustain the drug, prevent its being forced through the openings, and at the same time admit of a *free flow* of liquid; hence, something was necessary which would not yield, and become dense and impermeable. And, after experimenting with a variety of substances, I must acknowledge having as yet found nothing to equal "rice hulls," which answer the purpose admirably.

GASKETS OR WASHERS FOR STILL-HEADS.

There is another matter to which I desire to call attention, a matter applying particularly, however, to those who manufacture on a large scale, necessitating the use of large stills, in which "gaskets" or "rings" are indispensable to form a perfectly tight-fitting joint, and prevent the loss of alcoholic vapor during distillation. Those gaskets are usually made of rubber and cloth insertions, others of pure rubber, and some are fibrous. They are sold by weight, varying from 90 cents to $1.50 per pound according to quality, width, etc., and consequently are rather expensive necessities, especially when large in diameter, and require frequent renewing, as is the case when subjected to much heat.

This being another article my process requires—some of them over two feet in diameter—and with the view of economizing as much as possible, I concluded to try an experiment which I had reason to believe would yield satisfactory results. Purchasing 5¼ feet of ¾-inch 3-ply steam hose, having sewed the ends together, the rings were placed upon a vacuum chamber, and retained there for several days, tightening it up occasionally, and what I now show you is the article referred to, after having been in daily use for nearly one year; it costs 80 cents and a little labor, whereas an ordinary gasket 18 inches inside diameter, $\frac{1}{16}$ inch thick, 3-ply, 1½ inches wide, weighing 1¾ pounds, corresponding to this one, would come to at least $1.50, a clear saving of 70 cents.

It is true this one has not been subjected to heat, yet I find in using them upon steam distilling apparatus that they are equal to the best, and superior to many of the regular gaskets—prolonged heat does affect them, but more so than gaskets generally, causing them to soften, become sticky, and peel. To overcome these objections, I first wrap them with good stout close-wove sacking in bands, which I find keeps them in good condition, and, if properly taken care of, they will last much longer than might be

supposed. I also show you a small piece of the "rubber steam hose" from which this gasket was made.

Prof. Ebert stated that a continuous percolation might frequently be faulty, while in the case of interrupted, repeated percolation, as here described, the partially saturated percolate would come together, and become well mixed before acting upon the remainder of the drug. He regarded this as an improvement on the ordinary methods of percolation and believed that the application of this principle in sugar manufacture to the percolation of liquors through bone coal would result in a large saving.

Prof. Remington referred to the danger that, if the apparatus was not perfectly perpendicular, the liquid might all drop from one side, and only partially extract the second portion of drug. Prof. Ebert did not deem this possible.

Prof J. U. Lloyd stated that rubber hose not compressed was very useful for supporting covers designed for preventing loss of alcohol by evaporation; the joint thus secured was perfectly air-tight.

Analyses of Coated Quinine Pills.

A VALUABLE paper by Virgil Coblenz, of Springfield, Ohio, was read at the recent meeting of the American Pharmaceutical Association by Prof. Remington. The author had analyzed the sugar-coated and gelatin-coated pills of the various manufacturers, and gave his results and analytical processes in full. The names of the manufacturers were not given, but it was stated that none of the houses of good standing were detected in adulterating or withholding sulphate of quinine.

The process employed for extraction of the alkaloid was that of Mr. Henry Maclagan, and the quinine in the residue was estimated by the method of De Vrij.* The quinine alkaloid thus determined was calculated to sulphate of quinine containing 16.18 per cent, or eight molecules of water of crystallization [$(C_{20}H_{24}N_2O_2)_2.H_2SO_4.8H_2O$]. The results were presented in tabular form, containing a very large number of figures, from which the following abstract was made, presenting the principal results:

No. of sample.	Coating.	Total sulphate of quinine calculated from herapathite.				Other alkaloids, per cent calc. on basis of quinine.
		1-grain Pills.	2-grain Pills.	3-grain Pills.	5-grain Pills.	
1	comp.	0.905	2.051	3 048		1.2
2	sug. c.	0.995	2.113	3.026		1.9
3	"	0.925	2.012	3.039		3.1
4	"	1.020	2 044	3.048		2.8
5	"	1.086	2 051	2.998		4.6
6	"	0.974	2.006	2.973		3.4
7	"	0.801	1.655	2.422		11.7
8	"	0.996	2.009	3.055		2.9
9	"	1.008	2.051	3.014	5.007	2 1
10	gel. c.	0 959	1.932	2.903	4.842	3.2
11	"	0.995	1.999	2.989	4.954	2.7
12	"	0.991	1.994	3.039	4.974	3.3
13	"	0.971	1.971	2.939	4.821	4.4
14	"	0.977	1.968	2 913	4.904	5.1
15	sug. c.	0.390	1 142	1.201		36 9
16	"	0 698	1.623	2.160		8.2
17	"	0.884	2.005	2 901		6.2
18	"	0.374	1.501	2.309	3.943	31.1
19†			1.962			6.39

In the discussion which followed, Mr. H. B. Parsons stated that the composition of all remedies capable of accurate analysis was a proper and legitimate subject for investigation. Great care should be taken to do such work thoroughly and impartially, and neither less nor more should be demanded of manufacturers than strict justice requires.

In regard to allowing the manufacturers the benefit of the extra molecule of water in sulphate of quinine, he did not think that the composition of the commercial salt warranted such allowance. He had found, by the examination of nearly one thousand samples, that this extreme limit of 16.18 per cent of crystal water was reached in only a very few cases—perhaps not more than three or four. He believed that calculation of results to sulphate of quinine containing 14.45 per cent of crystal water (seven molecules) was perfectly just, and probably in accordance with the real composition of the salt when free from adhering moisture. It was noticeable that the quinine of some manufacturers ran very closely to these figures for moisture, while other brands contained uniformly less moisture (usually between six and seven molecules), and that of still other makers was very variable in this respect.

The process of DeVrij for separation of quinine from the other alkaloids of cinchona bark, was stated to lead to very untrustworthy results unless applied with the most scrupulous attention to details. A large amount of practice was necessary before the analyst could be justified in publishing results based on this method. Thus a sample of dried sulphate of quinine, of high grade, gave 99.65 and 99.67 per cent of pure sulphate of quinine on duplicate determinations where great attention was paid to every detail of the process, but slight variations in quanti ties and manipulations gave widely-differing results.

In the third place, it was stated that because the determination of the quinine as herapathite by De Vrij's method failed to give results as high as those obtained by evaporation of the ethereal solution, it did not of necessity follow that "foreign alkaloids," or, in fact, any other alkaloids, were present.

It was frequently the case that glucose or other substances contained in the pills was extracted together with the quinine, and, if colorless, were not suspected, and so weighed and reported as "foreign alkaloids." The analyst was bound to support any charges as to admixture of other alkaloids by indisputable evidence—he must separate and identify such alkaloids beyond peradventure. A loose determination by difference was not allowable in cases where the honesty of the manufacturer was on trial.

Professor Prescott stated that Liebig's ether-test for sulphate of quinine was the one prescribed by the U. S. Pharmacopœia of 1870, while Kerner's ammonia test was the one contained in the German Pharmacopœia, editions of 1872 and 1882, and in our present U. S. Pharmacopœia of 1880. This test has withstood severe criticism, and such men as Kerner, Flückiger, Hager, and Hesse had indorsed it after thorough trial.

In known mixtures of pure sulphate of quinine with other cinchona alkaloids, it would invariably lead to detection of the cheaper alkaloids. It had been suggested that if these salts were crystallized with the quinine sulphate they could not be as readily detected, but this seemed very doubtful, because the test was applied to an aqueous solution in which both alkaloids were present.

The manufacturers are bound by pharmacopœial tests, and no others. It was, therefore, wrong to require greater purity in the sulphate of quinine used in pills than was demanded of the salt itself. De Vrij's process might very properly be used for scientific investigations, but the pharmacopœial tests were the only ones by which manufacturers should be judged. There are two things which the analyst is in honor bound to do, viz.:

First, to extract all the alkaloid from the pills and weigh it in a state of purity.

Second, to apply the pharmacopœial tests to this alkaloidal residue.

We have in the pharmacopœia of 1880, p. 277, an accurate method of testing adapted to the case in hand. It is obvious that if the proper amount of alkaloid is extracted and weighed in a state free from non-alkaloidal substances,

* Pharm. Journ. Trans., 1, xi., p. 448.

† This is a lot of 2-grain quinine pills made by the writer from Powers & Weightman's quinine.

and if the residue thus obtained meets the test requirements of the pharmacopœia, no more can justly be asked of the manufacturers.

Dr. B. F. Davenport, of Boston, stated that in his capacity as analyst to the Massachusetts State Board of Health he had always applied the pharmacopœial tests, and had been governed by them in drawing conclusions in cases of supposed adulterations.

Stathmetometric Methods of Assay.*

BY PROF. W. W. BARTLETT, OF BOSTON.

"Is it not desirable to have a stathmetometric method (in which the standard solution is made up to a given weight) as well as a volumetric method (in which the standard solution is made up to a given volume) inserted in the Pharmacopœia, thus doing away with the absolute need of measuring apparatus, which are dependent upon temperature?"

Among the many valuable additions which the Committee of Revision have engrafted into our excellent Pharmacopœia of 1880 is a list of reagents and volumetric solutions. In this they have wisely followed the example set by the German and British Pharmacopœias, they having already adopted them.

By means of these reagents and volumetric solutions, the pharmacist is enabled to satisfy himself of the purity of very many of his chemicals and pharmaceutical preparations, and is not dependent upon any one manufacturer, but may buy them in the open market, and test them for himself. This is a decided step in the right direction, for it places the responsibility just where it belongs, with the pharmacist, and makes him alone responsible, while in former times it was his custom to fall back upon the manufacturer.

But it is one thing to make a pharmacopœia, and quite another to force its universal adoption. This being the case, every operation should be made as simple as possible.

No doubt this was the aim of the committee of revision in introducing parts by weight to take the place of weights and measures. Another aim, no less important, was uniformity. This was carried out almost absolutely in the body of the Pharmacœpia; but when we come to the standard volumetric solutions, we find that the old way of weights and measures is still preserved. We find that volumetric analysis is here directed to be used, carrying with it all the inconveniences of adjusting temperature, expensive burettes, liter flasks, pipettes, graduated cylindrical liter jars, burette stands, etc.

The inconvenience as regards temperature is especially noticeable in making standard solutions, for any error made in preparing them will impair the accuracy of a large number of determinations. In climates where the temperature is uniform, this error, on account of the temperature, is constant, and a correction might be made accordingly. But in climates like New England, where the extremes of temperature prevail, and the changes are quite rapid (quite frequently changing 50° in a few hours), these changes cause us serious inconvenience, and are matters of grave importance. Especially is this noticeable when we are obliged to keep the liquid at a given temperature for a given length of time, or are working in midsummer or midwinter. By using the stathmetometric method, this correction of temperature and expensive apparatus is done away with, and much valuable time and expense saved.

The stathmetometric method of analysis has grown (and quite naturally) out of the volumetric method, and is one step forward in the march of improvement. All the apparatus that is required is some light containing vessel, such as a six-ounce prescription bottle, and a glass-tube drawn out to a fine point at the end, in order to get a drop (making a good dropping tube), a good balance, and correct weights, all of which the pharmacist keeps in stock. The glass-tube is placed in the bottle, the point resting on the bottom, and is weighed with it, and a record of this weight is carefully kept, and used when calculating an analysis. Or a Shuster's or Salleron's dropping glass may be used. The dropping glasses or flasks may be had at any of the dealers in chemical apparatus for twenty-five cents each. So the cost for apparatus is in any event small. The stathmetometric method is identical with the volumetric method, only instead of volume being used, weights are substituted, and the normal solutions are made up to a definite amount by *weight*, and *not* by *volume*. Thus the standard solution of oxalic acid is made by taking oxalic acid in perfect dry crystals, sixty-three grams, distilled water sufficient quantity. Dissolve the oxalic acid in seven hundred and fifty grams of distilled water, using gentle heat if necessary. Add enough distilled water to make the solution *weigh one thousand* grams. By using one-fifth part of these proportions, an ordinary six-ounce prescription bottle may be used. All the other standard solutions can be made in the same way, substituting the proper chemical or chemicals for oxalic acid.

In using this method, we follow the directions of the Pharmacopœia, only substituting grams for *cc*. Thus, on page 398, under Volumetric Solution of Oxalic Acid, read sixty-three grams in *one thousand grams*, instead of sixty-three grams in one liter. Again, on the same page, read one gram is the equivalent of oxalic acid 0.063 gram
ammonia absolute 0.017 "
and so on.

Again, on page 399 read: ammonium carbonate 2.616 grams taken, *fifty grams required*, and so on; *whenever* cubic centimeters are mentioned, use grams.

Hence, if we wished to ascertain the amount of absolute potassa in a given sample of potassium hydrate, we would proceed in this way: Having first ascertained the exact weight of the bottle and dropping tube mentioned above, we would next place a convenient quantity of the standard solution of oxalic acid in the bottle, and weigh. We would then weigh out a given quantity of the potassa, make a solution of it in distilled water, add an indicator (as a solution of litmus or phenol-phthalin) and drop in the solution just weighed (using the dropping tube) till exactly neutral. Then *weigh* the amount of standard solution left, and subtract this amount from the amount first taken, and the result will be the amount used. I have found in practice that in making normal solutions that I could make them in from fifteen to twenty minutes by this method, but when I was obliged to take temperature into account (as by the volumetric method), I was from two to three hours in preparing them.

In the case of oxalic acid, I find that it dissolves very slowly at 60° F., but by heating the bottle in a water bath and shaking, I find that it dissolves quite quickly, and, as we pay no heed to temperature, it can be finished as soon as dissolved. This is not the case when made by the volumetric method. For if we use heat above 60° F. in order to hasten the solution, we must cool again to 60° F. before we can add the remainder of the distilled water, and we must keep this distilled water at 60° F., or it will affect the temperature of the whole.

It might be urged that where the pharmacist has a great many samples of the same substance to examine that did not require great accuracy, the stathmetometric method would require more time, the standard solutions being required to be weighed each time. This is quite true; but these conditions do not happen to the pharmacist. He cannot use too great accuracy in examining the purity of his drugs, and he rarely has more than one or two samples of the same drug to examine at a time, and the time taken to arrange the temperature would be far greater and the result less accurate.

I am convinced that this method should by all means be introduced into the Pharmacopœia, at least in addition to, if not wholly replacing, the volumetric method.

* Read at the meeting of the Amer. Pharm. Assoc. in reply to Query 25.

Stathmetic Estimation.*

BY ALFRED B. TAYLOR.

ALTHOUGH volumetric solutions were introduced into the British Pharmacopœia in 1864, they have not been used to any considerable extent in the United States, and did not find a place in our national pharmacopœia until the recent revision of 1880.

The subject of volumetric analysis has not received from pharmacists that consideration and attention which its importance deserves.

It is believed that few pharmacists know much about volumetric analysis, and it is to be regretted that a still smaller number put into practice what they do know. The opinion appears to prevail that the subject is very difficult and abstruse, and that it requires more time, attention, and expense that can conveniently be spared either for its study or its practice.

Quantitive analysis, or the operation of ascertaining, separating, and accurately weighing the constituents of a compound, is frequently very complicated and tedious, occupying a long time, in many cases requiring elaborate apparatus, and in every case the exercise of much care and precision, as also a considerable amount of experimental knowledge.

Volumetric analysis, on the other hand, is easily and quickly performed, as a general rule is susceptible of extreme accuracy, and needs much simpler apparatus.

The name does not appear to be exactly a proper one, since the process is used not for the purpose of ascertaining the ingredients of a compound, but simply to determine the quantity of some ingredient already known. It should, therefore, be rather called "volumetric estimation," or "determination," or "volumetric testing."

The leading principle of the method consists in submitting the substance to be estimated to certain characteristic reactions, employing for such reactions solutions of known strength, and from the volume of solution required for the production of such reaction, determining the weight of the substance by the aid of the known laws of chemical proportions.

In a paper by the author, published in the *American Journal of Pharmacy* for July, 1880, the following suggestions were thrown out:

"Might not the process of volumetric analysis be much simplified, and especially, in view of the abandonment of measures of capacity by the United States Pharmacopœia, would it not be more in accordance with the plan of the work, if measures of capacity were abandoned here also? It is proposed, then, that all test solutions shall be made to weigh certain amounts, instead of being made to measure certain volumes. In using a test solution thus prepared, it is evident that every grain weight of it would combine with a certain specific amount of the substance to be tested; no further observation is necessary than to note how many grains of the test solution have been used, and to obtain the answer to the problem is a simple matter of calculation. This plan would do away with all apparatus; the only instruments necessary to carry it out would be flasks or appropriate vessels in which to weigh the solutions, and an accurate set of scales and weights to weigh them. Variations in temperature would not affect the results; the process is more easy of application, and inasmuch as weighing can be done with more exactness than measuring, greater accuracy would be obtained. This plan would be equally satisfactory with any system of weights, whether the British system, or the metric system, or if simply parts of weight were used."

Any pharmacist would be enabled to use the tests, and would be much more likely to use them, than if special apparatus had to be employed. It is believed that the results obtained would be equally satisfactory. Many of the burettes and graduated vessels made for volumetric purposes are incorrectly marked, and hence are worse than useless, because they mislead those who rely upon their accuracy; and it is feared that many pharmacists into whose hands they may come have not the experience or skill to verify their instruments.

These suggestions were brought before the Committee of Revision of the Pharmacopœia, and, upon a vote being taken, the following was the result: Four (4) voted to introduce this process to the exclusion of the volumetric process, seven (7) voted to introduce it alongside of the volumetric process, while twelve (12) voted not to admit it, and it was therefore rejected.

Notwithstanding this decision, it is believed that time will show its availability and superiority, and that in the near future it will be admitted. It has been objected to the scheme that accurate scales and weights would be required. This is true; but these are already required to make the standard solutions used in the volumetric process, the solid ingredients of which must be carefully and accurately weighed.

The name stathmetometric (derived from the Greek words "*σταθμητος*," *weighed*, and "*μετρικος*," *pertaining to measure*) has been applied to this method of testing.

Although we speak of things being measured by weight, we generally use the term "weights" and "measures" as meaning specific and distinct subjects, the word "measure" being usually restricted in its application to length or distance, and to size or capacity. For this reason, the word metric, as applied to determination by weight, is not entirely appropriate; besides which the term "metric" has a special significance with which the scheme of testing has no necessary connection.

I have, therefore, suggested in place of "stathmetometric," the term "stathmetic," from the Greek word "*σταθμητικος*," *pertaining to weighing*, a word which is more easily uttered, and which is as completely significant as the longer word.

I would respectfully ask the members of this Association to give the volumetric and stathmetic processes a comparative trial, and report the results of their experience at the next annual meeting.

DISCUSSION.

Mr. Charles Rice remarked that the question of the introduction of the stathmometric process of assay—alongside of the volumetric—had been carefully discussed by the committee, but that, on a vote being taken, the majority decided to introduce the volumetric, exclusively. There was no particular opposition to the stathmometric process, which, in careful hands, is capable of yielding equally accurate results. But for rapidity of work and general handiness the volumetric appeared preferable. In using the latter, after the test solution has once been made, there is only *one* weighing required (in an ordinary simple analysis), namely, the quantity of the substance to be tested. If this be a liquid, and it is to be measured instead of weighed, then this measuring may be done at the same temperature at which the test-solution happens to be at that time—that is, at the ordinary temperature of the room. The influence of temperature upon volumetric assay has been somewhat overestimated, unless extremes of temperature are taken account of. Given two volumetric solutions, say one of oxalic acid and an equivalent one of permanganate of potassium, both made on a cold day, these two solutions will still be found practically equivalent even in summer, and if they are used in the assay of a liquid or of a solution (perhaps specially made by dissolving a solid in water to measure a certain volume), it will only be necessary to make the solution, or to measure the liquid at the same temperature at which the volumetric solutions then are to obtain practically reliable results. In the case of the stathmometric method, several weighings are necessary in each analysis. First, the substance to be tested; secondly, a suitable quantity of the test-solution (which may, perhaps, be contained in a Salleron flask, this being a small, broad-bottomed flask with a drawn-out and bent nozzle to deliver drops from) must be accurately weighed, and, when the reaction is completed, this must be weighed again. In this case, also, much depends on the delicacy and accuracy

* Read at the meeting of the Am. Pharm. Assoc.

of the scales, those commonly found in the shops leaving much to be desired. While it was formerly quite common to find the volumetric apparatus for sale in the market often inaccurate and unreliable, this is not so much the case now; measuring vessels and burettes now for sale in New York are remarkably correct and trustworthy. If, however, any pharmacist had not ready access to a market affording this apparatns, he is quite justified in having recourse to the stathmometric process, which requires no specially-constructed apparatus, and is capable, in careful hands, of yielding perfectly satisfactory results.

Prof. Bartlett stated that pharmacopœial preparations are now made entirely by weight (except fluid extracts), in order to secure greater uniformity and accuracy. He argued that if the method of manufacturing by weight was the most accurate, the method of analysis by weight must also be more exact than volumetric methods. He believed that one reason why the stathmetometric method had not found favor with the revision committee and with chemists generally was that it was yet new and not thoroughly tried.

Mr. Rice replied that the arguments in favor of employing parts by weight in pharmacopœial preparations did not apply equally to volumetric solutions. In making a pharmacopœial tincture, for instance, up to a certain weight, a few drops more or less will be sensibly felt by the scale, while they would not be distinguished by the eye in a measure. After such a preparation is once accurately made, it is ready for use. Of course it will expand by heat or contract by cold, but this is of no account so long as the preparation is used by *weight*, and if it is to be measured, the variation of volume is in practice disregarded. In making volumetric solutions, however, which are usually made in sets equivalent to or neutralizing each other, changes in volume by difference of temperature are usually avoided by preparing the solutions at one and the same time, at the same temperature (of the room). They will, therefore, remain practically equivalent to each other at other temperatures not too remote from that at which they were made.

Prof. Markoe favored volumetric methods for practical work. The results obtained were very accurate, and great rapidity could be attained in testing.

Mr. H. B. Parsons stated that the stathmometric method had given correct results in his own hands, but that it was not more accurate in practice than was the volumetric method, the amount of care necessary to be observed was fully as great, while much more time was consumed in the execution of most analyses. He drew attention to the fact that the stathmometric method of assay was new to chemists only in name, not in principle. If it had possessed sufficiently great advantages on the score of accuracy it would have been much more widely adopted.

It is noted that the accuracy of an analysis frequently depended as largely upon the good judgment and manipulative skill of the analyst as upon the correctness of the analytical process. A rather faulty method in the hands of an expert workman frequently gave as correct results as could be obtained by an inexperienced workman with the most improved process. This personal error is too much disregarded in the interpretation of results. In actual practice the difference in personal error frequently counterbalanced the accuracy of an analytical process.

In view of these facts it is doubtful whether the stathmometric process would yield more accurate results, if generally employed, than can now be obtained by the volumetric process of assay.*

* It must be acknowledged, however, that several of the arguments advanced by Mr. Taylor, and especially Prof. Bartlett, are well worthy of being carefully considered and once more subjected to careful test. The improvement suggested by Prof. Bartlett, of withdrawing the test-solution by means of a pipette—instead of dropping from the neck of the flask, which often results in the loss of drops—appears to be of value. This pipette might be so constructed as to remain permanently in the solution, and to serve as a stopper for the bottle containing the test solution. Such a pipette, provided with a rubber bulb, has lately been proposed for *volumetric* use, the pipette being, in fact, a burette. Whether the loss incurred by evaporation of the film of solution adhering to the outside of the pipette is sufficiently large to in alidate the results, after a time, is a point which deserves further investigation.—Ed. N. R.

Downdake Bark.

Dr. Vulpian states that a shrub found on the western coast of Africa called downdake [?] is used by the natives as a febrifuge. It is bitter in taste and orange-red in color, and formed of easily-separable layers. An organic base is obtained by boiling the bark in water acidulated with sulphuric acid, and treating the filtered liquid with lime; the precipitate is drained on a cloth with pressure and the marc is then mixed with alcohol. The alcohol solution is concentrated by distillation and evaporation in vacuum, and yields a substance which, after several evaporations, is a yellow powder of microscopic rhombo-hedral crystals, bitter, alkaline, and soluble in alkohol and water. This is called downdakine [?], and is said to act as a hypnotic and antiseptic.—*The Druggist*, from *L'Union Méd.*

[Dr. Thurber, the well-known authority upon botany and editor of the *American Agriculturalist*, some time since remarked to us, that so far as his observation went, every locality has some indigenous bitter which the people of that neighborhood hold in good repute as a remedy for malarial fevers. It is not unlikely that any bitter capable of stimulating stomach digestion or acting as a tonic generally, will prove serviceable in counteracting the effects of miasmatic poison, and that Providence has wisely provided that such agents shall be as widely distributed over the earth as are the poisons themselves.

Thus far the bitter principles of the cinchonas have in a great degree displaced the other bitters as antifebrifuges and also to some extent as general tonics; but there is good reason for thinking that many other bitters might prove equally efficacious for the latter purpose, and even serviceable as febrifuges were they attainable in such quantities as to render their use practicable. For such purposes this African shrub may be no better than a number of others, its sole claim to superiority being that it is indigenous to Africa, and therefore more easily obtainable than foreign bitters. In the same way vegetable bitters indigenous to the United States may be preferable, for local use, to those obtained from abroad.—Ed. N. R.]

Table of Germicidal Strengths.

In a paper on "The Germicide Value of Certain Therapeutic Agents" by Dr. G. M. Sternberg, published in the *Amer. Jour. of Med. Sciences*, of April, 1883, Dr. Sternberg gives the following amounts as the strengths required for certain reagents, enumerated, to destroy the vitality, or prevent the development of the micrococcus of pus. The fluid containing the micro-organisms, with proper precautions, to guard against errors, was subjected to the test liquids for two hours:

	Efficient in the proportion of one part in
Mercuric bichloride	20,000
Potassium permanganate	800
Iodine	500
Creasote	200
Sulphuric acid	200
Carbolic acid	100
Hydrochloric acid	100
Zinc chloride	50
Tinctura ferri chloridi	25
Salicylic acid dissolved by sodium borate	25
Citric acid	8
Chloral hydrate	5

	Failed in the proportion of
Fowler's solution	40
Sodium hyposulphite	32
Sodium sulphite (exsicated)	10
Ferric sulphate (saturated sol.)	16
Potassium iodide	8
Liquor zinci chloridi	8
Zinc sulphate	20
Boracic acid (saturated sol.)	4
Sodium borate (saturated sol.)	4
Sodium salicylate	4

Strengths Required to Restrain Germ Development.

Mercuric bichloride	35,000
Iodine	4,000
Sulphuric acid	1,800
Carbolic acid	500
Salicylic acid and sodium biborate, equal parts	200
Boracic acid	200
Ferric sulphate	200
Sodium biborate	100
Alcohol	10

Elixir of Valerianate of Ammonium.*

VALERIANATE OF AMMONIUM, 256 grains; SIMPLE ELIXIR, AMMONIA WATER, CARMINE SOLUTION,† of each a sufficient quantity.

Dissolve the valerianate o ammonium in twelve fluid ounces of simple elixir, and bring this to the measure of sixteen fluid ounces by the addition of a sufficient amount of simple elixir. Then cautiously add ammonia water until in slight excess, and color with solution of carmine until decidedly red.

Each fluid drachm (teaspoonful) of the finished elixir represents two grains of valerianate of ammonium, the same as adopted by the American Pharmaceutical Association, 1873.

Valerianate of ammonium, especially if the valerianic acid is in excess, has, to most persons, a very offensive odor. This the addition of the ammonia water tends to subdue; but wherever valerianate of ammonium is free, or in aqueous solution, the odor will remain. If dissolved in officinal alcohol, however, it is scarcely apparent, but such a solution will not conform to our modern "elixir." The addition of water to the alcoholic solution revives the odor.

The history of this elixir is of interest, since it was among the first of the popular elixirs introduced, and has retained its prestige to the present day. In an essay by Mr. Trovillo H. K. Enos, read before the Maryland College of Pharmacy, 1861, the statement is made that "a preparation known as Pierlot's solution of valerianate of ammonium has long been used among physicians in Philadelphia, but the disagreeable taste and odor of the solution having been found objectionable to patients, the pharmacists have been led to suggest some mode of disguising both, and presenting the preparation in an agreeable form for administration, without materially altering its effect, and the form of an elixir has been adopted." Mr. Enos then gave his formula, which was as follows:

Valerianic acid	1	fluid drachm.
Simple syrup	1	" ounce.
Extract of sweet orange peel ...	2	" drachms.
Alcohol	1	" ounce.
Orange flower water	½	" "

Distilled water, carbonate of ammonium, of each a sufficient quantity.

Dilute the valerianic acid with one-half fluid ounce of water, neutralize it with the carbonate of ammonium, add the alcohol, having previously mixed it with the fluid extract of orange-peel, and then add the other ingredients, and filter. In the year 1863, Mr. Joseph Roberts accepted a query in the American Pharmaceutical Association, as follows: What is the best formula for elixir of valerianate of ammonium, which shall be nearly free from valerianic odor, and elegantly aromatized. Having failed to reply in 1865, Mr. J. Faris Moore gave a formula to the Society, which, in substance, agreed with that of Mr. Enos, the principle being the formation of valerianate of ammonium from valerianic acid by saturating it with carbonate of ammonium. At this day, valerianate of ammonium is employed instead of the valerianic acid.

* From Prof. J. U. Lloyd's new work on Elixirs (see title in August number, p. 252).

† *Solution of Carmine.*—This preparation has been used some twelve years by the writer in preference to any "tincture" of cochineal. The fat in cochineal causes such preparations to putrefy in warm weather, and to extract the fat by means of ether from the powdered cochineal previous to tincturing is expensive and tedious. The term tincture of cochineal is scarcely appropriate as applied to the aqueous solutions made of cochineal, cream of tartar, and alum, and as the object is simply to secure a coloring matter, the term might with equal propriety be applied to our solution of carmine made as follows:

Carmine, No. 40.....	60 grains.
Distilled water.....	4 fl. oz.

Ammonia water, glycerin, of each a sufficient quantity.

Powder the carmine, and triturate with the water, gradually adding ammonia water, until the carmine disappears, and a dark-red liquid, free from insoluble matter, remains. To this add the glycerin, and mix. Should this solution ever become murky, a little ammonia water will restore its transparency. Solution of carmine is necessarily alkaline, and cannot be employed to color acid liquids. For all neutral or alkaline solutions it is admirable, and for soda water syrups is far preferable to aniline red.

On Specific Volumes.*

BY PROF. OSCAR OLDBERG, PHAR. D., ST. LOUIS.

THE term *specific volume* is proposed by the writer to express, in pharmacy and other arts, the relative volumes of substances, in the same sense as the term "specific gravity" designates their relative weights.

I am aware that the term "specific volume" has been applied, of late years, in chemical physics to express the relation of the atomic volume to the specific gravity at the ordinary boiling-points, but for this purpose the terms "atomic volume," "molecular volume," and "equivalent volume" have also been used, and it is not believed that the use of the term "specific volume," in the sense proposed by the writer, will in the least interfere with its limited application in chemical physics.

The term specific volume is analogous to, and the parallel of, the term specific gravity, and will be so understood by pharmacists. It is the only term the writer has been able to find which adequately and exactly expresses what is intended, and it was accordingly selected.

The specific volumes of substances are inversely as the specific gravities, and parallel with the latter. The volume of one gram of any liquid stated in cubic centimeters expresses its specific volume. Thus, as 1000 grams of the official alcohol measure 1,234.5 cubic centimeters, at 25° C. (77° F.), the specific volume of that liquid is 1.2345 at the temperature named.

As the specific gravity of a liquid or solid is the weight of a certain volume of that liquid or solid divided by the weight of an equal volume of water, so the specific volume of a substance is the quotient obtained by dividing the volume of a certain quantity by weight of that substance by the volume of an equal weight of water. It is, in other words, the quotient obtained by dividing unit (or 1) by the specific gravity. The product obtained by multiplying the specific gravity by the specific volume is *one.*

To illustrate the character and uses of specific volumes, we account for the familiar fact that a pound of alcohol measures more than a pound of water, by the fact that the specific volume of alcohol is greater than the specific volume of water. The absolute weight of any given quantity of a liquid expressed in grams, when multiplied by the specific volume, at once gives the number of cubic centimeters occupied by it.

Since the new pharmacopœia of the United States was published, the necessity of a table of specific volumes becomes manifest. If we take any one of the pharmacopœial working formulæ for tinctures, we find that, by substituting grams for "parts by weight," the final product is to be one hundred or one thousand grams; but we cannot ascertain how much that product will measure, except by a troublesome division of the number of grams by the specific gravity. Whereas, if we know the specific volume, the whole problem resolves itself into simply multiplying the specific volume by 100 or 1000, as the case may be.

Numerous blunders are being made in attempting to translate the working formulæ of the new pharmacopœia from parts by weight into definite quantities by weight and measure, and many of these errors arise from the necessity of comparatively difficult and tedious calculations, in the absence of a table of specific volumes.

I have prepared and now present, in connection with this paper, a table showing the specific gravities and the specific volumes of the liquids of the pharmacopœia, so far as their specific gravities are officially given. It embraces the acids, ammonia, alcohol, diluted alcohol, ether, glycerin, syrup, the solutions, many of the oils, etc.

An examination of this table will readily convince any one of the practical usefulness of specific volumes. We find in it, for instance, that the specific volume of ether is one and one-third, that of water is 1, that of glycerin four-fifths, that of benzin one and one-half, and that of chloroform two-thirds; therefore, one and one-third pints of

* Read at the Meet. of the Am. Pharm. Assoc.

TABLE

Of Specific Gravities and Specific Volumes of Some Liquids.

LIQUIDS.	WEIGHTS.			VOLUMES.		
	SPECIFIC WEIGHT, WATER, 1	WEIGHT OF 1,000 CC. IN GRAMS.	WEIGHT OF 1.0 U. S. FL. OZ. IN AV. OZ.	SPECIFIC VOLUME (WATER 1).	VOLUME OF 1,000 GMS. IN CC.	VOLUME OF 100 AV. OZ. IN U. S. FL. OZ.
Acid, acet., U. S.	1.0480	1048.	109 1	954	954.	91.6
Acid, acet., dil., U. S	1.0083	1008 3	105.0	.992	992.	95 2
Acid, hydrobromic, 34 per cent	1.303	1303.	135 7	.767	767.	73.6
" " dil., U. S.	1.077	1077	112.2	.928	928.	89.1
" hydrochloric, U. S.	1 160	1160.	120 8	.862	862.	82.8
" " dil., U. S.	1.049	1049.	109.3	.953	953.	91.5
" lactic, U. S.	1.212	1212.	126 2	.833	833.	80.
" nitric, U. S.	1 420	1420.	148.	.704	704.	67.6
" " dil., U. S.	1 059	1059.	110 3	.944	944.	90.6
" oleic, U. S	0.800	800.	83.3	1 250	1250.	120.
" phosphoric, U. S.	1.347	1347.	140 3	.742	742.	71 2
" " dil., U. S.	1 057	1057.	110.1	.945	945.	90.7
" sulphuric, U. S	1.840	1840.	191.7	.543	543.	52 2
" " dil., U. S	1 094	1094.	114.	.914	914.	87 7
Ether, U. S.	0.750	750.	78 1	1.333	1333.	128.0
" fortior, U. S.	0 725	725.	75.5	1.379	1379.	132.4
Alcohol, U. S. (at 15° 6′ C., 60° F.)	0 820	820.	85.4	1.219	1219.	117.
" " (at 25° C., 77° F.)	0.812	812.	84.6	1.231	1231.	118.1
" dil., U. S. (at 15° C., 60° F.)	0.928	928.	96.7	1.077	1077.	103.4
" " (at 25° C., 77° F.)	0.920	920.	95 8	1.087	1087.	104 4
Aqua destillata, at 4° C	1.000	1000.	104.17	1.000	1000.	96.0
Aqua ammoniæ, U. S.	0 959	959.	99 9	1.043	1043.	100 1
" " Fortior, U. S.	0.900	900.	93.75	1.111	1111.	106.7
Benzinum, U. S.	0.670	670.	69.8	1 493	1493.	143 3
Carbonei bisulphidum, U. S.	1.272	1272.	132.5	.786	786.	75.5
Choloroform. purific. U. S.	1.488	1488.	155.	.672	672.	64.5
" venale, U. S	1.470	1470.	153.1	.680	680.	65 3
Glycerinum, U. S	1.250	1250.	130.1	.800	800.	76.8
Liquor ferri acet., U. S.	1 160	1160.	120.8	.862	862.	82 8
" " chlorid., U. S.	1.405	1405.	146 4	.711	711.	68.3
" " persulph., U. S.	1.320	1320.	137 5	.757	757.	72 7
" potassæ, U. S.	1.036	1036.	107.9	.965	965.	92.6
" sodæ, U. S.	1.059	1059.	110.3	.944	944.	90 6
Mel.	1 333	1333.	138.8	.750	750.	72.0
Oleum adipis.	0 900	900.	93 75	1.111	1111	106.7
Ol. amygdalæ express.	0 919	917.	95.5	1.091	1091.	104 7
Ol. aurantii cort.	0 860	860.	89 5	1.163	1163.	110.6
Ol. bergamii.	0.875	875	91.1	1 143	1143.	109.7
Ol. caryophylli	1 050	1050	109 4	0.952	0952.	91.4
Ol. copaibæ	0.890	890.	92.7	1.123	1123.	107 8
Ol. cubebæ	0.920	920.	95 8	1.087	1087.	104.4
Ol. eucalypti.	0.900	900.	93.75	1.111	1111.	106 7
Ol. gaultheriæ	1.173	1173.	122 2	.852	852.	81.8
Ol. gossypii seminis	0.925	925.	96.4	1 081	1081.	103 8
Ol. lavandulæ.	0.890	890.	92.7	1.123	1123.	107 8
Ol. limonis	0.850	850.	88.5	1.176	1176.	112.9
Ol. lini.	0.936	936.	97.5	1.068	1068.	102 5
Ol. menthæ piper.	0.900	900.	93.75	1.111	1111.	106.7
Ol. morrhuæ	0.920	920.	95 80	1.087	1087.	104 4
Ol. olivæ	0 916	916.	95.4	1.092	1092.	104.8
Ol. ricini.	0 960	960.	100.0	1.042	1042.	100 0
Ol. rosmarini	0.900	900.	93 75	1.111	1111.	106.7
Ol. sassafras.	1.091	1091.	113.6	.917	917.	88 0
Ol. sesami	0 918	918.	95.6	1.089	1089.	104 5
Ol. terebinthinæ.	0.862	862.	89.8	1.160	1160.	111.4
Spir. ætheris nitrosi, U. S	0.824	824.	85 8	1.214	1214.	116.5
Spir. frumenti.	0.920	920.	95.8	1.087	1087.	104.4
Spir. vini gallici.	0.930	930.	96.9	1.075	1075.	103 1
Syrupus, U. S	1.310	1310.	136 4	.763	763.	73.3
Tinct. ferri. acet., U. S.	0 950	950.	98.9	1.052	1052.	101.1
" " chlorid., U. S	0.980	980.	102.1	1.020	1020.	98 0
Vinum album, U. S.	1.000	1000.	104 17	1.000	1000.	96 0
" rubrum, U. S.	1.000	1000.	104 17	1 000	1000.	96.0

ether, one pint of water, four-fifths pint of glycerin, one and one-half pints of benzin, and two-thirds pint of chloroform, respectively, have the same weight. We also learn at once from the specific volume the number of cubic centimeters occupied by each gram of these liquids.

The pharmacist can learn, by the aid of this table, how large a bottle or other vessel it takes to hold a certain quantity by weight of any of these liquids, and that it takes twice as large a bottle to hold a pound of ether as to hold a pound of chloroform.

The specific volumes given are, of course, calculated from the official specific gravities, and to verify their correctness it is only necessary to multiply the numbers of the specific gravities, when the product must in each case be exactly *one*, or as near unit as is practicable.

I believe that a table of this kind in our pharmacopœia would be of great practical value, as it entirely obviates some of the objections to the method of "parts by weight."

The table accompanying this paper also shows the weight of 100 fluid ounces, and the volume of 100 avoirdupois ounces of each of the liquids included in it.

[During the discussion it was stated that the committee for the revision of the U. S. Pharmacopœia was instructed to publish a table showing the relation between the weight and the volume of all pharmacopœial liquids. It should, however, be stated that the idea of "Specific Volume," in the sense treated of in the preceding paper, is new and should be credited as original to Prof. Oldberg.]

Oil of Birch as a Commercial Substitute for Oil of Wintergreen.*

BY G. W. KENNEDY.

BEFORE answering the query, I will furnish some little information on this subject which no doubt will be of some interest to the profession. It is well known that little has been done for almost forty years towards determining the true chemical composition of the oil. Procter, in 1844, found it to contain salicylic acid, and from that time up to 1882, nothing was done until the writer made some experiments which proved the presence of salicylic acid, and that it was almost identical with the oil of gaultheria. I have two specimens here, one the oil of birch, and the other oil of gautheria, which are known to be absolutely pure. You will observe whilst they both possess or have that strong and agreeable aromatic odor, and a sweetish, aromatic taste, characteristic of both oils, yet by close comparison a difference can be perceived. This is another case where two oils obtained from different plants closely resemble each other, if not identical. We have the same thing in the oils obtained from the Ceylon cinnamon (Cinnamomum zeylanicum), and Chinese cinnamon (Cinamomum aromaticum); also the oils of Pimpinella Anisum and the star anise (Illicium anisatum). The sample of oil of birch which I have exhibited was made last March. It was then colorless, but now, as you will notice, has acquired a reddish color. This year, Mr. H. P. Pettigrew, a member of the coming graduating class of the Philadelphia College of Pharmacy, made a thorough investigation of the oil, which can be found in the August number of the *American Journal of Pharmacy*, the results of which are briefly summarized as follows:

1st. The volatile oil of birch is not identical with the oil of gaultheria, in that it consists entirely of salicylate of methyl, and contains no terpene.

2d. The specific gravity of oil of gaultheria is not 1.180, as stated in the United States Pharmacopœia, but 1.0318, the former being the sp. gr. of oil of birch, which, as is known, is often indiscriminately sold and employed as oil of gaultheria.

Mr. Pettigrew evidently made a very careful and creditable analysis of the oil, but, failing to discover terpene, induced the writer to investigate the process more carefully by which the oil is obtained, believing that the hydrocarbon was washed away during the manufacture of the oil. In this supposition I was correct, as I soon detected the mistake of the distillers by which the terpene is lost, which I shall explain further on. In my paper on oil of birch, published in the *American Journal of Pharmacy*, vol. xii., p. 48, 1882, I gave a concise description how the oil is extracted; a portion of which I here repeat for our benefit.

"The material, being ready for distillation, is placed in the still, as much as it will hold, and a sufficient quantity of water is added to fill the still about one-third full. The still is generally permitted to remain in this condition over night. A fire is made in the morning, and distillation proceeds nicely. The condensers are of two different kinds, one being the ordinary copper worm placed in a large barrel, while the other is made of copper pipe about two inches in diameter, and shaped like the letter V, each wing being twelve and one-half feet long, and placed in a trough. A stream of cold water is constantly passing into the barrel and trough, which is carried several hundred feet by a wooden gutter from a clean, clear creek of spring water. The condensed steam in the condenser consists of water and oil. The V-shaped condenser, the distiller says, is more desirable than the other, because the first portion of distillate contains oil, whilst in the old worm style several bucketfuls of water pass out before a drop of oil makes its appearance. As the liquid comes from the condenser, a novel contrivance is used for collecting the oil and water, consisting of a Mason's fruit jar (large size) complete; a small tin funnel is placed in the metallic cap of the jar at one side, which extends below the cap, the condensed liquid runs through the funnel into the jar, and, as the weight of the oil is greater than that of the water, it sinks to the bottom of the receiving vessel. The water runs out through a pipe fastened into the cap on the side opposite to that where the funnel is inserted, is conducted into a bucket, and, finally, emptied into a barrel, to be used again for the next lot of material. The same plan is carried out on a larger scale at nearly all of the distilleries."

You will at once see the defect in the distillation. The distiller collects that portion which falls to the bottom of the vessel, which is no doubt exclusively salicylate of methyl (methyl salicylic ether), the light terpene separating and floating about on the surface of the water in drops. This is known by the names of "light oil" and "light ring." No care is taken to collect it, and it is nearly all washed away or lost. I communicated with a number of distillers on this subject, asking them if they had ever noticed a light substance on the top of the water, and the reply was always the same; "they had, and that they never took any pains to save it, not knowing it had any value." This would explain why Mr. Pettigrew failed to get any terpene. Judging from the quantity explained to me which separates, the oil certainly contains as much as the oil of gaultheria, ten per cent. In this locality, the oil of gaultheria is made in a similar manner as the oil of birch. I presume, upon examination, it would be found lacking gaultherilene. Athough the sample spoken of by Mr. Pettigrew in Prof. Maisch's possession came from me, I have every reason to believe it strictly pure.

Its low specific gravity would also indicate that it contains the hydrocarbon. The two samples on the table, you will please observe, in specific gravity are about the same. Oil of gaultheria is 1.181 at 84° F., the oil of birch 1.180 at the same temperature.

Old leaves of gaultheria do not yield as much oil as new leaves. Old leaves and plants that have never been picked yield approximately twelve ounces to one hundred pounds of the leaves. Spring leaves, or leaves gathered in the spring from plants that have been previously picked twice a year, in the spring and towards fall, yield about fourteen ounces to one hundred pounds of the leaves. Again, the leaves gathered in September from first year's plants yield as much as a pound upon one hundred of the leaves.

* Read at the Meeting of the Amer. Pharm. Assoc. in answer to the query, "Is oil of birch sold in commerce under the name of oil of wintergreen?"

Returning to the query, I would answer, yes, the oils of birch and wintergreen are mixed, sold, and used indiscriminately as oil of gaultheria. Enormous quantities are made in this county and the few adjoining counties. One would wonder for what purpose it is all consumed, and where it all goes. In the counties of Carbon and Monroe, there was not less than twenty tons made last year, and, from present indications, will reach that quantity this year. The percentage of oil of birch is estimated at forty per cent. Bradford, Sullivan, and Susquehanna Counties make about two tons annually. About twenty per cent is oil of wintergreen. Schuylkill makes about one thousand pounds, which contains about ten per cent of oil of wintergreen. In the first two counties, the leaf (teaberry) grows more abundantly. That accounts for the larger percentage of the oil.

Prof. Maisch stated that the volatile oil does not pre-exist in birch bark, but that it is formed by decomposition during the distillation with water. He agreed with Prof. Lloyd that many commercial samples of oil of wintergreen contained no light hydrocarbons, as they were completely saponified when treated with caustic soda, while hydrocarbons were present in other samples.

Prof. Lloyd stated, in reply to a question, that it was his opinion that little, if any, artificial methyl salicylate was offered in this country as wintergreen oil.

Prof. Maisch called attention to the fact that at the Centennial Exposition a large amount of artificial methyl salicylate was exhibited by German manufacturers, and that there was a possibility that this article might find its way into our markets whenever it could be profitably sold in place of true oil of wintergreen.

Prof. Diehl, of Louisville, Ky., stated that the sample of oil of birch exhibited by Mr. Kennedy had a slight empyreumatic odor which might be due to careless heating. He questioned whether the pure oil of birch could be distinguished by odor from oil of wintergreen. Probably, differences in odor are not due to chemical differences between the two oils, but rather to careless manufacturing methods.

It was admitted that mixtures of oil of birch with oil of wintergreen could not be detected by any of the ordinary methods, if indeed at all, because of their chemical and physical similarity.

Plantain as a Styptic.*

J. W. COLCORD.

SEVERAL articles during the past few months, copied from English pharmaceutical journals, calling attention to the stypt c properties of plantain leaves—Plantago major—having attracted my attention, I determined to try a few experiments when opportunity offered. Having a shiftless neighbor, whose yard produced a bountiful crop of the article, I was easily able to secure an abundant supply for my experiments. Believing that better results would be obtained from fresh plants than from dried I expressed the juice from them by means of an "Enterprise mill," obtaining about 16 fluid ounces of juice from 3 pounds of leaves. The juice was of a light-green color, very turbid, evidently caused by a large amount of chlorophyll. Setting aside 4 ounces of the filtered liquid for further experimenting, I packed the residue from the press into a conical glass percolator and exhausted with dilute alcohol, evaporating the percolate in a water-bath to two ounces, mixing with the 12 ounces of expressed juice and adding 2 ounces of alcohol. This preparation which I call a fluid extract represents virtually equal parts by weight, of the dried plants. It is of a dark-brown color, with a marked odor of the recent plant, and so far, after standing three months undisturbed on my shelves, shows no sign of precipitation.

My next experiment was a mixture of equal quantities of the expressed juice with glycerin. At the present time, after standing three months, the mixture is clear and bright, with no sign of precipitation. This, I think, promises to be the most efficient preparation, and will prove valuable as an injection in the treatment of leucorrhœa, hemorrhages, and similar disorders.

Experiment number three was made with equal parts of the juice and alcohol, and number four with three parts of the juice with one part of alcohol.

In a short time a precipitate was observed in both samples in about equal proportions, and was removed about one month after making by filtering through paper, and neither has shown signs of precipitation since, and continue bright, clear, light brown liquids.

Of their therapeutic value as styptics, I have not had sufficient trial to form an opinion, although, as far as I can judge, they have proved satisfactory. While writing this article, a cook from a neighboring restaurant, with a finger sliced off in a potato slicer, exposing the bone, came in for treatment. Having bandaged I applied the glycerate, which soon stopped the profuse bleeding, giving her a small bottle of it to apply subsequently. I asked her to report to me in two or three days, and, on reporting, I found a healthy granulation presenting. Its styptic properties are undoubtedly due to tannic acid, as all the tests I have been able to make prove this to be the case. The readiness with which it can be obtained in the summer renders it a valuable adjunct, undoubtedly, to the materia medica of the country practitioner or housewife for stopping hemorrhages in simple wounds.

The bruised leaves applied directly usually prove sufficient for the purpose; as to whether it will prove sufficiently valuable to add to our list of pharmaceutical preparations will require longer and more extended experiment.

* Read at the Meeting of the Amer. Pharm. Assoc.

Vaseline and Lard: A Dispensing Curiosity.

M. VIGIER (in the *Union Pharm.*) states that he had to dispense the following prescription:

	Grams.
Vaseline	40
Ext. rhataniæ	4
Ext. belladonnæ	4

He found it impossible to get a perfectly homogeneous ointment. Triturate as much as he would, the black points of extract were indestructible. Using lard instead of vaseline, the combination was easy, and what was curious was that he had no trouble in combining either of the extracts separately with the vaseline. He found, too, that the ointment was easily made by substituting ten grams of lard for ten grams of the vaseline.—*Chem. and Drugg.*

NOTE BY ED. N. R.—The fault of the operator was that he attempted to incorporate the extracts as such, without the intervention of a liquid. By first reducing the extracts to a soft paste, free from granular masses or lumps, with the aid of diluted alcohol, a very nice, homogeneous ointment can be prepared. Compare the paper by Prof. J. P. Remington in our last and the present number.

Table Mustard.

MR. DIETRICH gives the following formula:

Taragon herb, dry	50 parts.
(or fresh	150) "
Dill seed	10 "
Caraway seed	10 "
Water	q. s.

Make an infusion with 2,000 parts of water; strain, and pass enough hot water through the strainer to make 2,500 parts. To the hot liquid add

Black mustard, deprived of oil and powdered	500 parts.
White mustard, deprived of oil and powdered	500 "

When the mass is homogeneous add

Common salt	100 parts.
Sugar	200 "

Heat a short time longer, and finally add

Diluted acetic acid	500 parts.

Semi-Annual Report on Commercial Drugs and Chemicals.

(From the *Handelsbericht* von Gehe & Co., Dresden, September, 1883.)

Aconitine.—Gehe & Co. state that their *pure crystallized aconitine*, prepared from Swiss Aconitum Napellus roots, may be considered as being equal in properties and effects to that prepared by Duquesnel. They also prepare a *pure crystallized nitrate*. [From the accompanying price-list we find the price of the pure crystallized alkaloid to be not quite four times that of the ordinary amorphous.]

Asafœtida—has been in as eager demand as during the past year or two. London received no less than 800 chests since last March; but each lot was taken at higher prices, and cheap qualities are now entirely out of market.

Atropine.—The refuse substance obtained during the manufacture of atropine, namely, "belladonnine," of which Gehe & Co. furnished a quantity to Professor Ladenburg, of Kiel, was at first supposed by the latter chemist to be identical with *hyoscine* (*amorphous hyoscyamine*). But more recent experiments made with further samples have led him to different results, the publication of which he reserves.

Balsam of Peru.—The monopoly in this important drug, which had been in the hands of a speculator for several years, appears to have been permanently broken. The price is not unlikely to decline still further. The method of testing adopted in the new German Pharmacopœia by means of petroleum ether and nitric acid,* has been unfavorably criticised by a competent authority, and has also been found unreliable by Gehe & Co. The latter state that the temperature ranging during the reaction seems to have some influence over it, inasmuch as a specimen of balsam which had at first been found suspicious, and was once more tested, after being for some days exposed to sun-light, complied with all the requirements of the test.

Balsam of Tolu. The former notion that the genuine balsam should always appear as a hard mass is now almost generally recognized as erroneous.

Belladonna Leaves—have been scarce and high in price. A good deal of inferior leaves has been brought to market.

Benzoic Acid—The two varieties made from horses' or cattle urine are at present very depressed in price, since aniline manufacturers have ceased to consider them of higher value than the acid prepared from toluol. Most of the manufacturers of the first-mentioned kinds of acid have, therefore, been compelled to stop work. And unless some new advantages over the toluol-benzoic acid should be found in these varieties, they will undoubtedly shortly become chemical rarities, like another variety of benzoic acid which was, for a short time only, manufactured in France from phthalic acid.

Gehe & Co. have succeeded in isolating a peculiar substance, which imparts a brown color to benzoic acid, as described in the *Pharm. Germ.* While saturating a considerable quantity of the acid, they obtained a substance which they believe to be *benzo-phenid*, since it is decomposed by alkalies into benzoic acid and phenol. Dr. Kobert, of Strasburg, to whom they sent a little of this substance for physiological experiments, reports that in the organism it is *not* split into phenol and benzoic acid; at least he did not succeed in finding the amount of phenol increased in the urine of rabbits to whom this substance had been given. Some other experiments confirmed the first observations, and showed that the body produced not the least symptom of poisoning. This shows that the decomposition observed in the test-tube *does not take place* in the organism under the influence of the alkali of the blood; just as in the case of chloral, which has been supposed to, but does not, produce chloroform in the blood.

Bismuth Subnitrate.—Complaints which have now and then been made that Gehe & Co.'s subnitrate contained lead or arsenic have been shown to be false. In one case, sulphate of bismuth had been mistaken for sulphate of lead. The necessary caution had not been observed during the test, inasmuch as sulphate of bismuth remains in solution only at a low temperature.

Borax.—The large consumption of this article enabled the English refiners to keep up their price at 60*s.* per cwt., with only trifling concessions at intervals. *California Borax* has for several years ceased to be of any account for the European market.

Bromine.—The largely-extended German manufacture has, in order to be able to compete with the United States, considerably reduced the price of this article, but only to those who contract to use it exclusively for the preparation of bromides. This step will make the importation of American bromine permanently unprofitable.

Camphor.—The declining tendency of crude camphors has continued during the current year, and has especially affected Japan camphor. The London stock has diminished from 8,022 colli on January 1st to 5,846 colli on August 1st; 6,314 colli being disposed of and 3,238 being received during that time.

Cannabine Tannate is steadily gaining favor, as it enables the physician at the bedside to alternate with soporifics. As this compound does not produce any untoward secondary effects, and particularly does not affect the bowels, its value is more and more recognized. The preparation offered is carefully freed from a poisonous principle existing in hemp, the so-called "tetano-cannabine."

Cantharides have appeared on the market much later this year than usually. Hungarian flies were offered only in small lots and at exorbitant prices. Russian flies also stood higher. The price is likely to be still further advanced. Chinese flies arrived only in single bales at a time, and were offered at 2*s.* 6*d.* per pound.

Chinoline Tartrate.—Though this new remedy appears to have almost ceased to be in demand, it would now seem as if many of the failures in the hands of physicians with this febrifuge were due to the employment of large doses, instead of repeated small ones. This same error came near ostracising several other valuable remedies (*e.g.*, chloral hydrate) in the first period of their employment.

Cinchona.—From the manifold changes and surprising fluctuations in the commerce and prices of bark and quinine during the past few years, we had become accustomed to see the market adjust itself, not so much according to the natural law of supply and demand, but rather according to the notion of certain individuals. Still, there was always observable some sort of a connection between the crude material and the product. Now, however, we observe an entirely new feature, namely this, that the product (quinine), which fell in May to its lowest standpoint (for the expired portion of the present year), suddenly advanced 20 per cent, while the crude material followed a declining tendency; and besides that a further advance of 6 per cent was decreed by the manufacturers in the beginning of August, while the demand for barks—in consequence of the diminution of the manufacture by 40 per cent—was so feeble that of about 5,500 bales of bark offered at the auction of August 14th at London, only 900 bales found purchasers, at rates exceeding the previous ones by 5 per cent for South American and 10 to 15 per cent for East Indian barks. At present, East Indian barks are available at prices corresponding to 6 pence (or 51 pfennige) per each per cent of sulphate of quinine in each English pound of bark (or 112 marks per kilo of sulphate of quinine, exclusive of freight and cost of manufacture); on the other hand, the leading and conjointly acting manufacturers have fixed their price at 250 to 255 marks per kilo of sulphate of quinine. It is difficult to foresee how long such a condition of things can last and what effect it will have upon the bark market. Nevertheless, since the consumption of

* The test is directed to be performed as follows:
"If 1 gm. of the balsam be mixed with 5 gm. of petroleum benzin, the mixture thoroughly agitated and, after having been allowed to settle for a short time, 30 drops of the liquid be allowed to evaporate spontaneously in a porcelain capsule, the oily, yellowish residue, even when gently warmed, should not have an odor of turpentine, storax, or copaiba; and, on addition of 5 drops of strong nitric acid (sp. gr. 1.300–1.330), it should not assume a bluish, or bluish green color even when warmed." (These tests would show the presence of turpentine, storax, copaiba, or gurjun balsam.)

quinine during the present year is generally smaller than formerly, the price of bark will probably have to remain low particularly as the stocks are still increasing. According to the official reports, 55,439 bales reached London in the first seven months of this year, but only 32,735 bales were sold, so that the stock of 67,176 bales remaining on January 1st had increased to 89,880 on August 1st.

It is well known that the Colombian and New Grenada barks are constantly losing their importance. Last year's exports from Baranquilla, for instance, showed a considerable decrease:

1882: 89,867 bales, or 5,392,020 kilos, value $4.493,350;
1881: 113,982 bales, or 6,838.920 kilos, value $5,699,100;

and during the present year the deficit will be still greater. This fact somewhat explains the firm position a short time ago assumed by holders of these barks, while East Indian barks reach the market in such quantities that the expectation of their being shortly able to supply the whole demand of the world is well founded. The estimates heretofore made on the prospective shipments of bark from Ceylon appear to be borne out by actual fact, inasmuch as the following quantities were shipped:

Oct. 1st, 1879,	to	July 6th,	1880,	880,997 lbs.
" 1880,	"	"	1881,	885,661 "
" 1 81,	"	"	1882,	1.641,346 "
" 1882,	"	"	1883,	5,024,252 "

Javanese barks likewise arrive in continuously-increasing quantities. While the chief auction of government barks in 1882 amounted to only 162,000 pounds, the quantity sold in May last amounted to 250,431 pounds, and the area of cultivation is constantly extending. Upon Jamaica and in the Madras Presidency the cultivation of bark is likewise eagerly carried on. Hence it is not likely that there will ever be a deficiency in manufacturers' bark.

Cinchonidine Sulphate is much in demand and difficult to obtain. The U. S. take all that can be obtained, in spite of the fact that, by a mistake in the wording of the tariff-law, only the *alkaloid* cinchonidine (but not the sulphate) is admitted duty-free.

Cinchonine Hydrochlorate is only occasionally demanded, in large lots at a time. It does not, however, appear in the market [so far as we know, the market here meant is the Levant, chiefly.—ED. N. R.] under its true name, but is fraudulently put up as sulphate of quinine.

Cinnamon.—The low price for Ceylon cinnamon experienced an advance in the beginning of this year, but this advance was lost again at the quarterly auction sales at London (May 28th), when 3,000 colli were offered, but only 1,200 taken at reduced figures. Since then, the consumption has been more liberal, and, at the sale occurring on August 27th, when 2,600 colli were offered, the price remained steady, only the finest qualities being a trifle lower.

Cloves.—The increase in production, and the consequent fall in price, are well illustrated by the imports at Hamburg, viz.:

1881: 304,300 kil., worth 710,970 *marks*, or 2.34 per kilo.
1882: 316,300 " " 576,250 " or 1.82 per kilo.

Coca Leaves have been more abundant than formerly; but handsome, green leaves are still scarce, and always rule high.

Condurango Bark, from Mataperro, was in much demand; this, however, is not so much to be taken as a proof of the efficacy of the drug, but rather of the frequency of the disease (cancer) which it is supposed to relieve.

Convallaria Flowers have been collected in abundance, without, however, experiencing much reduction in price. The demand for the drug, which was most extraordinary during last year, has considerably diminished.

Copaiba.—While the arrivals of copaiba during the past year had been abundant (Hamburg received, in 1882, 64,200 kilos, against 41,700 in 1881), this was still more the case in the first half of the present year, and supplies of Maracaibo, Angostura, and Carthagena are abundant and declining in price. Para balsam, however, which is much asked for, rules higher even than genuine Maracaibo. Adulteration of this drug, particularly with East Indian Gurjun balsam, appears to be still carried on to a considerable extent.

Coto Bark appears to attract more general attention. True Coto bark is generally demanded, although orders have repeatedly been received from the United States for the Paracoto bark.

Cotoin, which had been almost forgotten for some time past, has been in quite brisk demand. Italian physicians, especially, have found it to be a most serviceable and active remedy in cholera. Besides being administered internally, it is also used hypodermically: 1 gram of cotoin dissolved in 4 grams of acetic ether at one injection.

Ergotinine (Tanret's).—This highly interesting substance continues to attract the attention of clinicians. (See the April report, NEW REM., 1883, p. 173.) The hypodermic dose of the remedy is 10 to 20 drops of a solution containing 1 milligram in each cubic centimeter.

Gehe & Co. keep this solution for sale, and quote it at 60 pfennige per milligram of alkaloid. The alkaloid itself is quoted at 220 marks per gram (or ab. 622 dollars per avoirdupois ounce). Of course, these prices would be considerably higher on this side of the Atlantic, owing to duty and other expenses.

Ferrum peptonatum commences to become quite a stable remedy. It is said to be one of the most easily assimilable iron preparations.

Goa Powder, although now officinal in the German Pharmacopœia, reaches the market, at present, only in small quantities.

Homeriana.—Some years ago, this herb was brought out with great flourish and noise; but it is now scarcely heard of. Its true botanic source does not seem to be clear; but it will scarcely turn out a mistake if we assume it to be a variety of the common *Polygonum aviculare*, perhaps somewhat modified by the peculiar conditions of its place of growth (Southern Russia).

Hydrargyrum peptonatum is still in demand for hypodermic use. It cannot be furnished as a perfectly clear liquid. Hence, it would seem to be preferable to use the *Hydrargyrum formamidatum* (see NEW REM., 1883, 281), although this has been but little asked for. Besides, it has been said that this preparation produces certain untoward effects not following the use of the former.

"Insect Powder" Flowers.—This is the third year in succession that Dalmatian flowers have been gathered in large quantities. The price is, therefore, so low that large holders refuse to sell at present. Most of the stock on hand at Trieste, however (altogether about 200,000 kilos), consists of the open and inert Ragusa flowers (ruling at 40 to 45 florins per cwt.), while only about 10,000 kilos consist of genuine wild-grown closed Montenegrine flowers (at 85 to 95 florins). Between these and the former, there are numerous grades of cultivated, closed, and half-closed Città-vecchia flowers.

Persian flowers have almost ceased to receive any attention.

Jequirity Seeds (from Abrus precatorius) are but rarely asked for, and their uses in certain ophthalmic diseases appear not yet to have been pushed beyond the experimental period.

Kairine—the proposed substitute for quinine (the hydrochloride of oxy-chinolin-ethyl-hydride), has been lowered 40% in price since it is made on the large scale. Still, as long as it is dearer than quinine, it will not be able to displace the latter,—and then only if it can be shown really to possess the antipyretic power and therapeutic advantages ascribed to it.

Kamala.—Only small arrivals of this drug took place, and none of it came up to the standard established by the German Pharmacopœia.

Musk.—Tonquin musk appears to be doomed to a continuance of high prices, for it is reported from China that each chop arriving at Shanghai, even if it is of inferior quality, immediately finds a purchaser, and that up to 135 taëls are paid at present. The shipments from Canton amounted to 2,256 catties in 1882, against 2,084 in 1881, and 2,691 in 1880; this year's shipments appear likewise

to have been considerable Whether the warlike complications in Tonquin and Yunnan will have any influence upon the collection and transportation of musk is not yet known Cabardine musk had to be paid for at high rates, at this year's fair at Irbit; it is likely soon to become scarce again.

Oils of Aurantiaceæ.—The prospect for this year's yield of *Oil of Lemon*, *Orange*, and *Bergamot* are very favorable, particularly for the latter, and the contract price of the latter is lower than it has ever been before Gehe & Co. state that all their supply of the above oils is from the two reliable houses known respectively by the marks " alser" and "Siles."

Oil of Caraway.—It has been held that the new German Pharmacopœia demanded oil of caraway to be pure carvol, that is, the high-boiling, fragrant, oxygenated portion of the oil, deprived of the terpene. This is denied by a prominent authority, as well as Gehe & Co. But, owing to the former notion being generally accepted as correct, Gehe & Co are compelled to furnish carvol, when "Oleum carvi, Pharm. Germ. II." is demanded.

Oil of Neroli—was expected to be enormously high, owing to the damage by frost to the orange trees in Southern France, but some surplus stock from last season as well as oils prepared in Italy, Portugal, and Algiers, have helped to prevent a large advance.

Oil of Rose—The general yield is smaller than was expected (4 0,000 meticals or about 2,300 kilos), though larger than in the preceding two years. As no stocks remained over, and very numerous purchasers had made their appearance in Kysanlyk, the peasants could only with difficulty be induced to sell at slightly reduced prices. All the oil is already bought up, and an advance of about 8 per cent has already taken place in second hands. Gehe & o. have found that the percentage of stearopten (the inert portion), in this year's oil varies between 24.4 and 32.5 per cent in genuine oils of equally fine aroma.

Opium.—The opium market has been very long quiet since a large yield was expected. Good *Yerli* opium had risen, after last year's small harvest, from 120 to 140 piasters in Smyrna; during March of this year it fell to 130; and, as about 2, ·50 couffes were still remaining in Smyrna, Constantinople and the interior, a further decline to 110 piasters took place in May, while at the same time *Karahissar* fell from 120 to 105, and *Tchequenti* from 102 to 86 piasters. This was the lowest point, for though some of the first purchases of the new crop were made even a trifle below the above figures, this shading is merely an allowance for about 5 per cent of moisture in excess. During May already, complaints were heard of damage done by rain to the poppy-heads during the time of incising; next came the assurance that the first estimate of 12.000 couffes had purposely been placed too high, and that only about 8,000 couffes could be expected. And finally, there was an improved feeling in the opium markets of London and New York. All this not only prevented a further decline, but brought about an advance in July by 10 to 15 per cent, and even 20 per cent more were asked for Constantinople grades, chiefly *Guévé* and *Bei Bazar*, which had formerly been very cheap. As purchasers then beat a retreat, the market became calm; but a further decline is not expected, since the so-called "soft-shipping" qualities (so much demanded for Chili and Peru), chiefly *Malatia* and *Boghaditch*, leave much to be desired, so that *Salonica* must be had recourse to; and besides, the bad outlook for Indian and Persian opium is likely to influence the market considerably, owing to the chance of China appearing as a heavy purchaser.

Concerning the quality of this year's crop of opium, the dearest grades (with the exception of *Salonica*) are not up to standard, being quite dark-colored and having a poor look.

Papayotin—belongs to the few modern remedies which have maintained their position. The arrivals of the inspissated juice of *Carica Papaya* are regular and the price was lower, so that the product could be also marked down Curiously enough, the demand for the weaker, 25 per cent preparation is more active than that for the pure substance.

In diphtheria, a 5-per-cent-solution of the pure papayotin is recommended as most active.

Paraldehyde—This new hypnotic has been much improved in quality (Gehe & Co. warrant it at 99 per cent) and lowered in price. It is asserted that two grams of it produce as strong and lasting an effect as an equal quantity of chloral, while its effects are more agreeable. It is to be expected that this substance will become a formidable rival of chloral as soon as its price has been further reduced.

Petroleum Ointment.—Although the new German Pharmacopœia has adopted an artificial petroleum ointment, prepared from a "solid" and "liquid" paraffin," the consumption of the homogeneous vaseline (both American and German) has steadily increased. At present the German market affords both liquid and solid paraffin, which complies with the requirements of the German Pharmacopœia, being but very faintly tinged by sulphuric acid—provided it has been kept in glass or metallic vessels.

Phosphoric Acid.—The establishment of new factories for making phosphoric acid from phosphorus has, up to the present time, prevented an advance in the price of phosphoric acid, although phosphorus itself has advanced.

Podophyllotoxin is coming gradually into use, and is quite reasonable in price.

Quebracho blanco is still in good demand. The alkaloid aspidospermine derived from it—which has been repeatedly reported as being devoid of the anti asthmatic action of the drug—has been more frequently asked for, which circumstance would indicate that the exact value of the drug has not yet been finally determined.

Quinine.—Since the last report, quinine has reached the lowest mark it has had for a long time. The chief cause of the depression was the competition between the European (Continental) and American manufacturers to monopolize the market in the United States, which was thereby overloaded. To realize on stock, sales had to be effected even at a loss and under compulsion, notably at one time the large amount of 56,000 ounces, which were sold at auction in New York, London, and on the Continent at 195 marks per kilo During June there suddenly appeared signs of a turning, the price advancing within a short time to 220, 240, and 250 marks. The simultaneous turn of the market permits the conclusion that there is an understanding among the manufacturers for the purpose of reducing exports to the United States, to refuse selling to speculators, to enforce higher rates for the article.

Rhubarb.—All sorts and qualities of Chinese rhubarb have become quite scarce. Stocks in London are lower than at any previous time (only 500 chests on August 1st, against usually about 1,200 chests or more), and all of poor quality. Higher prices are therefore to be expected, and no very high demand as to quality should be made for the present.

Salicin is very little asked for, and the price is so low that it scarcely pays to prepare it, even from the richest material.

Santonin.—This article has declined lower than at any previous period. The demand from Japan, which used to be the chief consumer, has almost entirely ceased, owing to great losses which the handling of the article has entailed to all concerned therein for some time past. A Russian factory is said to have a large depot of santonin in Vienna at very low prices, and after the new factory about to be built or already building at Tashkend (in Turkestan, in the very midst of the home of the source of santonin, namely Levant wormseed) will be completed, which is expected to be the case during the coming year, the further manufacture of santonin in Europe will be rendered entirely impossible.

Sugar of Milk.—The prevailing cold spells during the past summer have not been favorable to the milk-sugar industry in Switzerland. The production has therefore been small, and larger prices had to be conceded.

Vanillin has risen considerably in price; the competing factories have leagued together, and have placed the sale

of the product into only a few hands. The article is also manufactured in Paris, but only for the French market, since the Paris manufacturers are not allowed to export to Germany.

On the Mashing, Fermenting, and Distillation Grain into Whiskey.

BY C. K. GALLAGHER.*

THE Spiritus Frumenti of the U. S. Pharmacopœia, the preparation intended to be used when whiskey is prescribed by the physician, is a medicinal agent the therapeutic value of which entitles it to much greater consideration than is usually accorded by those called upon to dispense, and the same care should be used in selecting a pure whiskey of good quality for medicinal use that is given to the purchase of other remedies relied upon for such curative properties as are ascribed to the judicious use of this class of stimulants.

Usually, whiskey so-called is procured from the nearest saloon or grocery with little thought given as to the original source of manufacture, the material from which it is made, the method used, or the subsequent adulterations to which it has been subjected in passing through the hands of different dealers before reaching the consumer.

A knowledge of these facts, coupled with close observation of the sources of supply, the "mixing" "compounding," "blending," "cutting," "plunging," and other adulterations, practised by dealers in liquors, licensed, under the present Internal Revenue system, as rectifiers who for the sum of two hundred dollars per annum are allowed to so alter any distilled spirits by one or all of the above processes that the resulting product has little of the qualities sought for by the physician in the treatment of diseases, first induced the writer of this article to give personal attention to the manufacture of a pure and standard whiskey from selected grain. Samples from general stock are herewith submitted, with a description of the process and method of manufacture kown in the trade as hand-made, sour mash, fire-singled, and doubled in copper. These terms are used to discriminate a fine whiskey distilled in copper stills by furnace heat from the cheap, common spirit made by continuous distillation in wooden or copper stills by steam; also as distinguishing the slow method of fermenting the mash known as the "sour-mash plan" from the quick or sweet-mash method used in the manufacture of high wines which, after conversion into neutral spirit, are converted into the brandies, whiskies, gins, and rums sold by rectifiers and wholesale liquor dealers, and being mere mechanical mixtures or tinctures of diluted deodorized alcohol, with artificial flavoring, and sweetened, to deceive the eye and palate; they improve but little with age.

One of the usual methods of refining whiskey is to percolate it through charcoal, which absorbs a portion of the fusel oil and a larger portion of the light volatile oils, which gives to whiskey its flavor and body. After using the charcoal a few times, it becomes impregnated with the fusel oil, and having a stronger affinity for the finer volatile oils than for the fusel oil, a portion of the latter passes off with each subsequent run of spirits, and is replaced with the finer volatile oils. Therefore, whiskey refined by this process is very impure, if the same charcoal is often used, as is the general custom. Another objection is that the volatile oils and ethers which are the very life of the spirit, are leached out, leaving an inferior spirit, having few or none of the essential qualities of pure whiskey, and will not improve in flavor with age; the grosser oils will become oxidized, but the flavor and body will remain wanting. French spirit proper is nothing more than a redistillation of spirit made by the above process, more effectually removing the odor of ethers and bone coal through which it has lately passed; when thus prepared, it is free from all smell, and is a deodorized alcohol. The process I have used, and by means of which a pure whiskey, free from all poisonous substance, is made, embraces the following characteristics, none of which are patented. The selection of good, sound grain; and, after giving proper attention to malting, grinding, mashing, and fermenting by the old sour-mash plan, separating alcoholic elements by careful distillation in copper stills, by furnace heat, and purifying the alcoholic vapor from all deterious substances, by passing it through a solution of permanganate of potassium in the final destillation, and observing that the distillate is not allowed to pass into the cistern or receiver, after it falls to 90° by Tagliabue's hydrometer, the scale used by the Revenue Department.

The resulting spirit in the cistern will stand at or about 112° to 120°,* according to the manner in which the heat of the furnace has been urged, and should be carefully reduced to 100° at 60° Fahrenheit by the addition of distilled water. The samples sent are made by this process. This whiskey shows, by very delicate tests mere traces of fusel oil; it has an agreeable odor, and may be relied upon for use wherever an alcoholic stimulant is needed for medicinal purposes. After it has attained two years of age, connoisseurs will find it to rival the most approved brands.

The revenue laws being complied with, the machinery connected, and the material being at hand, proceed to prepare a first batch of yeast as follows:

Corn meal	½ bushel
Rye meal	1 quart
Barley-malt ground	1 quart
Boiling water	10 gallons
Brewers' yeast	½ pint
or	
Bakers' yeast	1 pint.

Gradually add the meal to the boiling water contained in a barrel, stirring constantly, until a well-broken mash free from lumps, is made; cover it with the rye meal, and let it stand for about two hours, or until the temperature is about 110° F. in winter, or 85° F. in summer. Then add the barley malt, and break up the mash by stirring well with the mash stick, add the yeast, stir well, and leave to work forty-eight hours.

It will be ready for use when it forms a head and settles down. In a small quantity like the above, all the water can be added hot at once, and cooled by stirring to the proper temperature. With this yeast, another and larger is made in precisely the same manner, using:

Corn meal	1 bushel
Rye meal	1 gallon
Barley malt	1 gallon
Boiling water	16 gallons

Proceed to scald the corn meal contained in a hogshead, and break up the mash, as before described; thin it with hot or cold water, as required to suit the season, so it will stand at 110° in winter, or 85° in summer.

(To be continued.)

Castor Oil and Glycerin.

DR. WILLIAM SOPER claims that glycerin increases the purgative power of castor oil when given with it. A preparation combining, but not mixing, these two is active in teaspoonful doses. In the Pharmacopœia of the Hospital of the University of Pennsylvania is the following formula, which, we believe, is Professor H. O. Wood's:

Mistura Olei Ricini.

Ol. ricini	fl. ℥i.
Glycerini	fl. ʒi.
Ol. menthæ piperitæ	gtt. ij.

—*Lancet*, and *Chem. and Drugg.*

* Read at the late meeting of the Am. Pharm. Assoc.

* By the U. S. Standard, in which absolute alcohol is called 200 per cent; hence, a 100-per-cent whiskey contains 50 per cent of absolute alcohol. The foregoing figures are usually read as degrees, and marked with a ° instead of a %.—ED. N. R.

The Harvesting, Stripping and Drying of Cinchona Barks in Java.*

WHEN is a cinchona tree fit for stripping? This question, repeatedly put whilst the history of the tree in its development was yet unknown, and at that time remained without satisfactory answer, now finds us fully prepared to reply, since regular cultivation has informed us of its power of growth, and chemical analyses have thrown light upon the formation and amount of the alkaloids. We can at present definitely say that the question resolves itself into a pure speculation within the discretion of the planter himself, from the moment when the tree is fully developed, that is to say, has formed its different layers, ranging from without inwards, as cork, parenchymatous layer and liber.†

Under favorable circumstances of soil and climate, and with unimpeded development, cinchona plants may be stripped with advantage in six to eight years from being planted out, so far at least as then the maximum percentage of alkaloid is formed by that time.

The maximum percentage of alkaloid, however, has nothing to do with the maximum production of bark; naturally this increases with the age of the plants, and so it is a considerable advantage for cinchona culture that its cropping is not obligatory upon fixed periodically recurring times. For instance, if the coffee berries are ripe, then they must be gathered without delay, and within a short margin of time; negligence in this would lead to loss. In most cultivated plants this is the case, but not so with cinchona. An exploitable tree loses nothing by delay in harvesting; on the contrary, having here to deal with the bark, when the tree has reached its maximum percentage of alkaloid contents, the bark itself increases in thickness and quantity, in proportion as it is allowed to grow on. The great difficulty lies in the choice of the genuine plants, and progress in propagating and rearing them. When the tiny plants have become actual trees, then they require little more attention or expense, and a cinchona tree eight years old which may yield a kilogram of dry bark, gives every promise (certainly even if the plantation is not disturbed in its development) of producing twenty-five to fifty per cent more at ten years old.

The value attained by the process of nature in eight years is doubled in the four following years. Thus if the planter is not forced to realize, he acts foolishly in beginning to harvest too soon. This truth needs no further comment. The harvest once begun, it can be carried on systematically, proportioned to the nature and extent of the planting. If a full-grown tree is smitten by serious disease, and its life is endangered, then it is evident it should be stripped. The bark is not easily stripped from sickly or dead trees, and they never yield regular handsome pieces. . . . By digging out, the entire stem is obtained, and use can be made of the root bark. It the stump is cut or sawn over, then a partial crop is obtained, but the chance remains of new produce within a few years. Of these two systems, which is *a priori* the best is more than can well be answered. All depends on local conditions and surrounding circumstances. The stock of plants in the nursery is the first thing to be asked; a second is the chance of success in filling up. The soil may have become quite unfit to insure a new planting living and thriving. In this case, the right way is to cut over the stem, so that new stems may be obtained from the old tree. Then again, ground which seems unable to support a second crop, after having given one, must have a change, so that the constituents of the soil may be restored. The planter who works with foresight and deliberation, so regulates his planting and harvesting, that he proceeds uninterruptedly, and does not trust to one card turning up trumps, by which a temporary, possibly years' long stagnation, would be the consequence.

The crop may be taken in any season, but for drying it, the rainy season is not favorable. Day after day, sometimes quite suddenly, the rain comes down, each time interrupting and hindering the drying process, and, moreover, it soon requires more attention, care and labor. On the other hand, the vital functions of the cinchona trees, in this and the transitional seasons, appear to be most vigorous, and therefore the bark is easier to remove. As a rule, meanwhile, it will be well to complete the periodical main harvest during the prevalence of the east monsoon, but that does not prevent utilizing the produce throughout the entire year, when thinning the plantations of trees for one reason or another. The stripping of sound, healthy stems and branches requires but little trouble, the more sappy the bark is, the more readily it comes away. Longitudinal incisions are made as far as the wood with a sharp knife, and afterwards, circular cuts at definite distances, naturally dependent upon the dimensions desired for the bark. The bark is then carefully turned up along the first named incision with the back of the knife, and so on, until it is liberated. If the stem is provided with knots or other inequalities, mostly caused by old wounds, bruises, or the sprouting of branches, then the bark clings more tightly to its seat, and more care and much patience must be employed.*

At first, we cut the Java barks 0.2 meter long, and 0.05 broad. The fresh strips feel like damp sole-leather, but are very brittle, especially that from Ledgeriana, on account of their short vessels. If handled roughly, the danger is run of breaking the regularly-cut piece. By circular incisions on the stems and branches, the bark is *par force* taken at the required length, the breadth as may be convenient, which may be ascertained after peeling. The breadth we at first fixed upon, 0.05 meter, was not without reason. In a fresh condition, the bark strips are flat, in drying they bend, and show a strong tendency to curl inwards, forming quills. Now a width of 0 05 meter forms, after complete drying, a close quilt; the longitudinal edges of the strips just meet each other. If the strips were taken broader, then the quills would be less regular in shape, or else curl up too much, and they would then be awkward to pack, because they should be filled up with thinner quills, which again gives fresh difficulty and necessitates, moreover, a strict sorting. The planter directs the industry according to local circumstance. Drying, sorting, and packing the produce must be done on the spot. A building is erected on the estate, where there is space for the drying-arrangements, and where constant supervision can be kept. Drying on the spot itself would reduce the weight and bulk of the product for transit, but the necessary care can hardly be expected in the different plantations, not to speak of the great number of sheds or roofed erections that would be wanted there, because of the uncertain or changeable state of the weather. Stripping, on the other hand, is preferably done in the plantations. the transport of the entire trees would be too expensive and troublesome. From the nature of the principles which stand in the fore-ground of exploitation it is evident that the planter, as a rule, himself should mark out the trees which are intended for stripping. Whether uprooting or cutting over be adopted, the work must always be done by a gang of trusty workmen. The trees being felled are deprived of their branches on the spot, and these, together with the stem, are transported to a central point in the plantation, where the barkers or shavers have come together in a shady spot, so that, during the hours of labor, the direct sun-heat may not be overpowering. Having regard to sorting, it is now advisable to keep quite separate

* (Chapters from the *Handbook of Cinchona Culture*, by K. W. van Gorkom, translated by B. D. Jackson; London, 188 . The account here given refers to the Dutch plantation in Java, and does not apply in every respect to the methods now followed in British India.)

† For accurate knowledge of the anatomical structure of the cinchona barks, *Oudeman's Handleiding tot de Pharmacognosie van het planten- en dierenrijk*, may be consulted. (Also, *Howard's Quinology of the East Indian Plantations.*)

* Knives of bamboo or buffalo horn, shaped like a paper knife, are made use of for peeling. Iron or steel knives might bruise the bark when loosening it, and also discolor it by the action of the tannic acid upon the metal.

the barks taken off at various heights of the stem, as well as those from the thick and the thin branches.

We know that the contents of the bark vary in proportion as it is met with higher or lower on the stem, and diminishes much upwards, that is to say, towards the younger portions. The same is the case with the relative weights of the barks, and the sorting may be done, after drying, according to its thickness, but it seems to be a safer rule for the estimation of its value to keep separate, directly after stripping, the barks from the lower, middle, and upper portions of trees of similar age. Indeed, from one tree the middle bark may be as thick as the lowest from another, so that the age and quality are not always strictly defined by relative thickness. This method of immediate preliminary sorting is, moreover, easier and surer, because it has not the least to do with valuation, and thus can be trusted to any one. Accurate sorting is of very great importance, if the analyses are remembered which were performed on the bark at different heights on entire trees.

For the quinine manufacturer the bark is more suitable and valuable, in proportion as it contains a preponderance of quinine. At a certain height on the stem, this alkaloid diminishes noticeably in quantity, also the weight of the bark is less than that taken lower down; though mixed with so much that is richer, the mass, as a whole, is poorer as to percentage. The case may present itself that the bark from a tree which is only considered fit for pharmaceutical use, by good selection and picking over, may yield its quota for the manufacturer.

When the daily task is completed, the laborers take the peeled bark in baskets to headquarters, where the produce is received by men thereto appointed, and regularly laid out on light, oblong-square racks of plaited bamboo. The filled racks, placed on rough frames to a height of 1¼ meter above the ground, remain in the open air exposed to the direct action of the sun's heat. In foggy or wet weather, and towards the afternoon or evening, in the mountain regions, when it becomes cloudy and moist, the racks are brought into a shed or under cover. Very soon the fresh strips of bark begin to curl up; thereupon the opportunity offers to unite the masses on two racks in one; and gradually more drying-room is available. In the mean time, theoriginal sorting is strictly kept up, and care is especially taken that the produce of different kinds and from various plantations is not mixed. In favorable weather, the drying is completed in a few days. When the barks rattle, on being heaped up, and have lost their pliability, a simple practical proof of their air-dried state may be taken. A piece is put upon a block of wood, and cleft across the middle, by a violent blow of a hatchet. If the clean-cut pieces spring up briskly, then the drying-process can be considered complete, and it is now ready to be preserved in its dry state. To this end, it is stored in dry, airy warehouses. Whether the stripping be done in the plantations or at headquarters, it is most essential that the barks of each kind of cinchona of similar origin and age should be kept by themselves, and be sorted according to their station on the stem and branches. To sort strictly and to cut into regular, uniform pieces are actions of the highest importance which cannot be too closely observed.

How and where the various operations take place matters nothing; the planter must guide himself as to these, with regard to circumstances which concern the economic and practical importance. Peeling the branches is naturally slower and less easy than doing so to the stems, and still more troublesome is barking the roots. From the latter only bits and broken fragments can be got, and no regular pieces. The workmen must be forbidden to wash off the earth adhering to the roots; they should instead be provided with stiff brushes.

. . . . . .

Comparative trials have repeatedly shown that no harm accrues to the contents of the bark when dried by summer heat. Artificial drying demands costly contrivances, and, moreover, damage to the outward appearance of the produce may soon be done, not to speak of the chances that, in dealing with large quantities, a remnant of moisture might be overlooked. One cannot be sure of equal drying, and by too violent a heat the contraction of the outermost layers of the bark may be so great that the produce may outwardly seem quite dry, and inwardly be still more or less green and wet. If there should be a single piece of bark in a bale or chest which is not completely dry, it might spoil the entire mass. It is well, therefore, to keep a sharp look-out so as not to include any suspected pieces, when packing. The case may occur that small parcels of bark, gathered, for some reason, at other times than the usual, must be artificially dried. Then an inclosed, but well-ventilated place is selected, merely taking care that the barks are not exposed to the smoke, and still less to the direct heat of the fire, the action of which would then be hard to regulate. Succirubra barks, which are usually termed "red bark" in trade, are seen in section and inside plainly red, and this color is probably enhanced by slow drying and temporary scalding of the fresh bark, by which it is longer exposed to the influences of light and air. At the auction of 1879, a small parcel of scalded bark was offered, but the results of the sale have declared nothing decided. Even less did a parcel of succirubra bark which had been covered with moss attain a higher value. This last bark was distinguished by its deeper color and its brittleness.

Colored Theater Grease (Fatty Face Paint).

White.

White wax	2	parts.
Oil olive (or sweet almonds)	3	"
Talc, powdered	1	part.
Zinc oxide	½	"

Or,

Chloride bismuth	5	parts.
White wax	2	"
Oil sweet almonds	5	"

Red.—Take the above bases, and add q. s. carmine. The most approved proportion seems to be one carmine to forty base, and the best procedure would probably be:

Carmine	1 part.
Water of ammonia (q. s. till dissolved), say	4 or 8 parts.

Rub intimately with powdered talc (six parts) till dry, then rub with base:

White wax	13½ parts.
Oil (olive or almond)	20½ "

—*New Idea.*

Elixir of Calisaya Alkaloids.*

Simple elixir	16 fl. oz.
Quinine (alkaloid)	12 grs.
Cinchonine (alkaloid)	6 "

Mix the alkaloids, and triturate them in a mortar with one fluid ounce of simple elixir, and then gradually add acetic acid in amount sufficient to effect their solution; then add the remainder of the simple elixir. Each fluid drachm (teaspoonful) of the finished elixir contains alkaloids sufficient to represent four grains of officinal calisaya bark. The preparation is that adopted by the American Pharmaceutical Association, 1875. The elixir has a distinct, bitter taste, and we have reason to believe that any substance which will overcome the bitterness, will do so at the expense of the alkaloids, rendering them insoluble Various plans have been recommended from time to time for detannating calisaya bark, usually by means of hydroxide of iron, first suggested by Mr. Meier, of New York, in 1867. These processes are tedious, and the product presents little, if any, advantages over a simple solution of the alkaloids. For this reason we consider this formula a practical substitute for "detannated elixir of calisaya."

*From Prof. J. U. Lloyd's new work on Elixirs. See title in August number, p. 252.

NOTES, QUERIES AND ANSWERS.

Under this heading we shall, to the best of our ability, endeavor to answer such questions addressed to us, as come within the scope of this journal, provided they are accompanied by the name and address of the writer. Answers to queries received after the 5th of the month will lie over until the next issue. Unless special instructions to the contrary accompany the query, the initials of the correspondent will be quoted at the head of each answer.

When asking for the formula of an unusual, patented, or proprietary compound, always accompany the query with any information you may already possess regarding the locality in which it is used, its use and reputed effects, in order to enable us to make inquiry without waste of time and labor. When it can conveniently be done, send also a specimen of the label used on packages of the compound.

No. 1,178.—**Herapathite** (A. D. B., M.D.).

Our correspondent wants to know how best to prepare crystals of this salt for microscopic use.

While giving this information, we append a few other remarks on the salt, in reply to inquiries received from several other correspondents (A. D. and B. J. McC.).

Herapath found that, on adding acetic acid to a solution of sulphate of quinine, warming, and dropping an alcoholic solution of iodine carefully into the flask in small quantities at a time—on cooling, crystals of iodo-disulphate of quinine will separate.

These have been ascertained to have the composition:

$$(C_{20}H_{24}N_2O_2)_4.3H_2SO_4.2HI.4I.3H_2O.$$

This compound had already been observed, in 1845, by Bouchardat; but it was not understood until Herapath examined it, in 1852.

The crystals are soluble in the mother-liquid when heated; also in hot alcohol; and are again deposited on cooling. In cold water, alcohol, or ether, they are almost insoluble.

Herapath observed that the crystals had the property of polarizing light, and could be used in place of native tourmaline (or Nicol's prism). For this purpose, they must be mounted; but this is a delicate operation, as they are easily altered or broken. It is recommended to cautiously neutralize the excess of acid contained in the mother-water by ammonia, taking care not to precipitate the excess of the disulphate of quinine; a portion of the liquid containing the crystals is then transferred to a slide, the liquid removed with blotting-paper, and the crystals dried in a current of cold air. They are then mounted in Canada balsam, thinned with ether, without heat.

The original formula for preparing the crystals was as follows:

Disulphate of quinine (the commercial sulphate)	50 grains.
Acetic acid, spec. grav. 1.042	2 fl. oz.*
Proof spirit (49.24% of absol. alc. by weight)	2 fl. oz
Tincture of iodine (ʒ 1¼ to O.i.)*	50 drops.

Dissolve the disulphate of quinine in the acetic acid previously mixed with the spirit, heat the solution to 130° F., and immediately add the tincture of iodine in drops, constantly agitating.

The preparation should be made in a wide-mouthed beaker, and the temperature should be maintained for a little time after the addition of the iodine, so that the solution may become perfectly clear and of a dark sherry-color. It should then be set aside to crystallize in a room of a uniform temperature at 45° or 50° F., and kept from vibration. This may be effected by suspending the beaker or flask by the neck with a string [or rubber-band], attached to a horicontal cord stretching across the room; or placing the beaker or flask on a steady support lying on a pillow, or rubber-bag. The large crystalline plates form upon the surface of the liquid, where they are allowed to remain for twelve or twenty-four hours, until they have acquired sufficient thickness. The flask or beaker is then carefully removed without shaking, and set upo a gallipot. A circular cover is next fastened to the end of a glass-rod, with a little wax or marine glue, and passed beneath one of the crystalline films, the adherent mother-liquor removed by blotting-paper [entirely freed from fuss], and the film allowed to dry at a temperature of 45° to 50° F. The cover and film are then placed under a small bell-glass, with a watch-glass containing a few drops of tincture of iodine. The time required for the "iodizing" may be about three hours at 50° F., or less, if the temperature be higher.

The film is then covered with a solution of Canada balsam in ether, saturated with iodine by warming with a few minute crystals of this substance, and allowing it to cool.

Other films are removed and mounted in the same manner. Should the films not separate from the original liquid at the end of six hours, this must be heated until the deposited crystals are dissolved, a little alcohol and a few drops more of tincture of iodine added, and the liquid again set aside.

If the film appear black when removed, it is crossed by an adherent or interposed crystal, which must be carefully removed.

Though the preparation of the crystals by the above-described method is comparatively easy, yet each operator will probably vary somewhat in the quantity and method of adding the tincture of iodine, etc., etc. It might therefore be advisable to prepare the compound with the aid of the iodosulphate of chinoidine, proposed by Dr. de Vrij as a quantitative reagent for quinine. This reagent is prepared thus: 1 part of commercial chinoidine is heated on a water-bath with 2 parts of benzol, whereby the chinoidine is partly dissolved. The clear, cold benzol solution is shaken with an excess of weak sulphuric acid, whereby a watery solution of acid sulphate of chinoidine is obtained. After ascertaining in a small part of this solution the amount of amorphous alkaloid contained in it, so that its whole quantity in the solution may be known, the clear solution is poured into a large capsule. For every 2 parts of amorphous alkaloid contained in the solution [that is, for about every 2 parts of true sulphate of chinoidine, free from crystallizable salt], a solution of 1 part of iodine and 2 parts of iodide of potassium in 100 parts of water is *slowly* added, under continuous stirring, so that no part of the solution of chinoidine comes in contact with an excess of iodine. By this addition, an orange-colored flocculent precipitate is formed of iodosulphate of chinoidine, which, either spontaneously or by a slight elevation of temperature, collapses into a dark, brown-red-colored resinous substance, whilst the supernatant liquor becomes clear and slightly yellow-colored. This liquor is poured off, and the resinous substance is washed by heating it on a water-bath with distilled water. After washing, the resinous substance is heated on the water-bath till all the water has been evaporated. It it is then soft and tenacious at the temperature of the water-bath, but becomes hard and brittle after cooling. 1 part of this substance is now heated with 6 parts of alcohol of 92 or 91 per cent on a water-bath, and is thus dissolved, and the solution allowed to cool. In cooling, a part of the dissolved substance is separated. The clear, dark-colored solution is evaporated on a water-bath, and the residue dissolved in 5 parts of cold alcohol. This second solution leaves a small part of insoluble substance. The clear, dark-colored solution obtained after the separation of this insoluble matter, either by decantation or filtration, constitutes the reagent. (*Pharm. Journ.*, 1882, Jan. 21st, and NEW REM., 1882, p. 70.)

If this reagent is to be used for the precipitation of quinine, as herapathite, the sulphate of quinine is dissolved in about twenty parts of alcohol containing 1.6 per cent of sulphuric acid, and the solution then diluted with more alcohol to forty parts. For every grain of sulphate of qui-

* English measure.

nine used, nine cubic centimeters of the above solution may then be added, the mixture heated to boiling, in a beaker, and then set aside to cool very slowly—that is, if large crystals of herapathite are required. Otherwise, the precipitation is performed in a flask, the mixture well shaken until somewhat cold, and further chilled off with ice. If the precipitate is to be weighed for the purpose of quantitatively estimating quinine, the precipitate is thrown on a tared filter, washed (under certain precautions), dried, and weighed. We shall have occasion to mention the details of this operation at another time.

No. 1,179.—**Rex Magnus.**

Since the publication of our October number we find in *Science* for September 14th a communication from L. P. Kinnicutt, of Worcester, Mass., relating to the composition and properties of "Rex Magnus," which answers the query then published. He thinks the following formula will roughly indicate its nature:

Boracic acid, Borax,	67 per cent.
Chloride of potassium	15 "
Water	18 "

The mixture also contains very small amounts of sulphur and magnesium, both of which are, probably, accidental impurities. In the periodical referred to may be found the detailed results of observations upon its preservative powers.

Answers in Exchanges.

DRUGGISTS' CIRCULAR.

Muriate of Quinine and Urea.—Dr. Jaffe, of the Hamburg General Hospital, suggests the following formula for this salt, which is especially useful for hypodermic injection, a gram of liquid holidng one-third of a gram of the salt, and its subcutaneous use producing but little local irritation.

Hydrochlorate of quinine	20 parts.
Hydrochloric acid	12 "
Urea	3 "
Water	sufficient.

Dissolve, filter, and evaporate over a water-bath to crystallization. The resulting salt is soluble in its own weight of water. [We have published the original process several times, *e. g.* in our volume for 1881, 368; compare also 1882, 72.]

Hyposulphite of Sodium in Wine.—A correspondent added an ounce of hyposulphite of sodium to thirty gallons of grape wine, in order to clear it and arrest fermentation. It not only did these things, but also spoiled the flavor of the wine; which tasted sulphurous.

Sulphite of lime, not hyposulphite, should have been used. Decomposition of the former by the acids of the wine liberates sulphurous acid gas which acts upon the vegetable ferment without injuring the flavor of the wine. With the use of hyposulphites, a certain proportion of free sulphur is also liberated, and is apt to impart a bad flavor. To remedy this, aeration or the cautious use of permanganate of potassium may be resorted to, a small amount of wine being first treated with a three or four per cent solution of the permanganate, which should be added drop by drop, with energetic shaking.

Tincture of Myrrh and Capsicum.—Under different names, a variety of formulæ are given, f. i., Dr. John King (American Dispensatory) gives the following:

"*Hot-Drops.*"

Powdered myrrh	8 ounces.
Cayenne pepper	2 "
Alcohol	1 gallon.

Thomson's formula for "*Number Six*" was as follows:

Myrrh	1 pound.
Capsicum	1 ounce.
Alcohol	1 gallon.

Liniment of Iodide of Ammonium.—

Iodine	15 grains.
Alcohol	8 ounces.
Camphor	2 drachms.
Oil of lavender	1 drachm.
Oil of rosemary	1 "
Water of ammonia	1 ounce.

Mix, and keep in bottles closed with stoppers or paraffined corks.

Black Stencil Paste.—

Bone black	1 pound.
Molasses	8 ounces.
Sulphuric acid	4 "
Dextrin	2 "
Water	sufficient.

Mix the acid with 2 ounces of water and add it to the other ingredients, previously mixed together. When effervescence ceases add enough water to form a paste of proper consistence.

Swedish Safety Matches.—According to Landström's patent, the tips of the sticks are coated with a mixture of 6 parts of chlorate of potassium, 2 to 3 parts of sulphide of antimony, and 1 part of glue. The friction surface is first rendered rough with glue and sand, and is then thinly coated with a mixture of 10 parts of amorphous phosphorus, 8 parts of sulphide of antimony, and 3 to 6 parts of glue and sand.

Quinine and Acetate of Potassium.—A clear solution of the following is desired:

Sulphate of quinine	20 grains.
Acetate of potassium	30 "
Simple syrup	1 ounce.
Distilled water	1 "

It is recommended that the quinine be dissolved in 6 drachms of the water and the whole of the syrup, with the help of just sufficient sulphuric acid. In the remaining 2 drachms of water dissolve the acetate of potassium and gradually add this to the first solution, avoiding throughout the use of heat.

Extract of Prunes.—S. Schmidt, of New York, recommends the following:

One pound of prunes are covered with water and set aside for several hours, when the water is to be poured off and fresh water added. This is several times repeated, and finally 1½ pints of distilled water is to be added, and the whole gradually heated on a sand-bath. Boiling is to be continued 20 to 30 minutes, and after cooling the prunes are to be reduced to a pulp. This pulp is to be placed in a half-gallon glass jar, and 1 pint of 95 per cent alcohol added. Set aside for two weeks, shaking occasionally, and then pass the juice through a strong, wet muslin strainer, and filter. Add 2 parts of syrup to 1 part of extract to make prune syrup, which is excellent for the soda-fountain, and may be used as a flavor, in place of simple elixir.

Ointment of Sulphate of Iron.—Add 8 to 15 grains of sulphate of iron to 1 ounce of purified lard, dissolving it first in a few drops of water.

"Unguentum Flavum," otherwise known as "Marshmallow Ointment," is made as follows:

Powdered turmeric	1 ounce
Lard	50 ounces
Yellow wax	3 "
Burgundy pitch	3 "

Digest the turmeric in the lard for half an hour over a water-bath; add the wax and pitch, and when all are melted together, strain. Formerly officinal in the German Pharmacopœia.

To Dissolve Hypophosphite of Lime.—When of good quality, this should be soluble in about six times its weight of cold water. An expeditious method is to use hot water and a mortar and pestle. The hypophosphite seldom or never completely dissolves, however, owing to an insoluble hypophosphite forming through oxidation. Only

when this insoluble portion is considerable, however, should the chemical be rejected. The addition of hypophosphorous acid will diminish the proportion of insoluble residue.

Glycerole of the Hypophosphites.—The joint committee of the Medical Society, and College of Pharmacy of the District of Columbia, have adopted the following formula:

Hypophosphite of lime	1½ Troy ounces
" " soda	240 grains
" " potassa	230 "
Sugar	3 Troy ounces
Glycerin	16 fluid ounces
Boiling water	10 " "
Orange-flower water	1 fluid ounce
Oil of bitter almond	2 minims

Dissolve the salts in the boiling water, and filter. Dissolve the sugar in the filtrate, with the aid of heat. Strain, and add the other ingredients.

Beeswax for Petroleum Pills.—A correspondent having received, for compounding, a prescription calling for a 36-grains-of-petroleum mass, to be made into 12 pills, incorporated sufficient powdered gum-arabic to enable it to be worked, and the resulting pill weighed about 7 grains. Some time afterward, he experimented with beeswax, in place of gum-arabic, and asks the opinion of the editor of the *Druggist's Circular* respecting the propriety of its use in such a case. 15 grains of the wax were required to render the mass of proper stiffness, so that each pill contained 1¼ gr. of wax.

[The editor says that the use of wax in pills of an oleo-resinous nature is ancient and sanctioned by the best medical and pharmaceutical authorities. "Indeed, some masses could not be made at all presentable without wax, and as an excipient it is difficult to find one more acceptable on general grounds. No objection can be raised against the use of beeswax for helping to form a good, manageable petroleum-pill mass. Only the proportion mentioned by our correspondent appears larger then necessary; about one-half the quantity, we should judge, would be sufficient."

To the above opinion we take exception. If the only end to be gained were to make the pill, it would not much matter what was used; but beeswax, when incorporated with a mass, will certainly not help its solubility in the fluids of the digestive tract, and must certainly impair its remedial value. The use of beeswax for such purpose is certainly ancient, but, like some other ancient things in pharmacy, is now less in vogue. Upon this matter of making pills of so-called petroleum mass, no one has greater experience than Dr. Griffith, of Bradford, Pa., who was among the first to introduce the use of this agent into medicine, and in the pill which he uses largely as a remedy in pulmonary affections, Dover's powder is employed to give the mass consistence. Unless this be directed by the prescriber, however, its use would hardly be justifiable. It is not improbable that any other inert vegetable powder—like powdered licorice root—would serve equally well. We have lately used pills of "petroleum mass" thus made, and find them satisfactory, from a pharmaceutical point of view.

This "petroleum mass" is really the firmer paraffins which collect in the tubing of oil-wells, and is more or less impregnated with the oily elements, which are the active agents, therapeutically. If the latter are present in too large a degree to enable a mass to be formed, rational pharmacy would suggest an addition of the more solid *paraffin*. This is now to be found in almost every drug store, and its use involves nothing which is not called for in the prescription. There is one objection to the use of this, which also exists in the case of beeswax, viz., that heat may be needed to secure its thorough incorporation, and this may drive off the very elements whose presence renders the mass of therapeutic value. For this reason, a vegetable powder is preferable.—ED. N. R.]

Tincture of Iron Turning Black.—When this occurs soon after the tincture is made, it shows that all the ferrous chloride has not been converted into a ferric salt. The usual cause of this error is deficient strength of commercial nitric acid. To guard against this, ascertain the s. g. of the acid, or apply the pharmacopœial tests before adding the alcohol to the ferric solution. Till then, the iron solution can be further oxidized by more acid; but when the alcohol is present, it is more readily oxidizable than the ferrous chloride.

Brandreth's Pills.—Two formulas are given: the first by Hager, the second by Texidor y Casasa's General Pharmacopœia, Barcelona. [Neither are probably authentic.—ED. N. R.]

I.	Powdered podophyllum	10 grains
	Extract of podophyllum	10 "
	Poke-berry juice (inspissated)	30 "
	Saffron	10 "
	Cloves	15 "
	Oil of peppermint	3 drops
	Mix, and divide into 30 pills.	
II.	Socotrine aloes, Magnesia, Extract of senna, of each	64 grains
	Extract of cinchona	12 "
	" " rhubarb	16 "
	Oil of mint, " " anise, of each	1 drop
	Mix, and divide into 3-grain pills.	

Dispensing Difficulty.—A correspondent in Oberlin, Ohio, was the victim of the following:

Sulphate of cinchonine	1 drachm
Podophyllin	5 grains
Nitric acid	5 "
Water	4 ounces

Mix.

The editor remarks that, podophyllin being insoluble in neutral or acid aqueous mixtures, a nice-looking preparation is out of the question, and proceeds to give advice as to how to dispense it, remarking that, should 5 drops of acid be too little, he believes there would be no harm in adding enough to make a clear solution of the cinchonine; but, after all, it will be an unsightly mass, to which a shake-label will be needed.

We would suggest that no pharmacist can be justified in adding any more of an active ingredient than the prescription calls for. If the resulting product is not likely to do him credit as a pharmacist, he can either decline to dispense it, or he can confer with the prescriber and secure some modification of the formula, or he can dispense it with the understanding on the part of the purchaser that the fault lies in the formula, and not in his knowledge of pharmacy.

It is only quite recently that a very good and conscientious New York pharmacist undertook to help out a prescriber's ignorance by volunteering a little pharmaceutical skill, and it cost him $100 damages and more than as much lawyer's and other fees. The man who writes such prescriptions is, as a rule, the last to appreciate the services of a good pharmacist, and the first to malign him.

To Remove Iodoform Odor from Mortars.—W. W. Gregory, of Modesto, Cal., puts in chloride of lime, enough dilute sulphuric acid to form paste, uses the pestle, and then cleans with clear water.

Dispensing Difficulty.—A correspondent sends the following, which gave him trouble in dispensing:

Powdered assafœtida	15 grains.
" camphor	10 "
White turpentine	6 "
Oil of peppermint	4 drops.

Mix, and divide into ten pills. The editor suggests calcined magnesia, beeswax, or some absorbent powder, such as marsh-mallow, with a drop or two of syrup, and subsequent correspondents advise calcined magnesia as entirely able to form a mass of suitable pillular consistence.

Solubility of Oil of Orange.—Oil of orange is not soluble in its own volume of ninety-five per cent alcohol, and

a failure to do it is no evidence of impurity. Recent investigations show that these oils are composed of more than one distinct principle. One, which possesses almost all the flavoring properties, is readily soluble in alcohol of moderate strength; while another, having but little odor, and closely resembling terpenes, is but slightly soluble in strongest alcohol. These elements probably vary in different specimens.

Dispensing Eserine.—J. Salm, of New York, advises that, owing to its tendency to absorb moisture, eserine should be mixed with an equal weight of glycerin. When the alkaloid is prescribed, of course double the quantity must be dispensed. To keep the alkaloid dry, it may be mixed with a known proportion of carefully-sifted lycopodium. To dry the moist alkaloid, it should be placed in an open vessel over a small porcelain dish filled with concentrated sulphuric acid, and the whole then covered with a bell-jar. An air-pump may be also used, if available, to expedite evaporation

Another correspondent remarks the very deliquescent character of the sulphate of eserine, and says: "The solution soon acquires a rose-colored tint, deepening in color with time, but nevertheless appears to retain its medicinal activity. The salicylate of eserine, which is now officinal, is a much more stable salt, not as soluble as the sulphate, and giving an almost colorless solution; like the preceding, reddening with time, but possessing the same properties as the sulphate. Their medicinal activity, so far as used for eye cases, is not diminished by their change of color. Solutions kept in this climate (San Francisco) for three or four weeks appear fully as efficacious as those freshly prepared.

THE DRUGGIST.

Pyrophosphate of Iron and Phosphoric Acid in Prescriptions.—A correspondent desires information respecting the best mode of dispensing the following:

Sulphate of quinine	ʒ i.
Pyrophosphate of iron	ʒ iv.
Dilute phosphoric acid	ʒ iv.
Sulphate of strychnia	gr. i.
Syrup of white pine	ʒ i.
Peppermint water	ʒ vi.

M.

Having dissolved the quinine in the acid, he added the strychnia and a portion of the peppermint water He then dissolved the pyrophosphate of iron in the remainder of the aromatic water, neutralized the solution, and added the syrup. After shaking, a white emulsion resulted, but after a few days the mixture was returned in the form of a solid, dark-colored mass. In commenting upon the above, the editor remarks that G. M. Baker, of Brooklyn, has shown that impurity of the acid is not the only cause of such change, but that the pyrophosphate itself is changeable. First the purity of the acid should be tested by adding some of it to tincture of chloride of iron, when no precipitate should form, otherwise it is apt to have been made from glacial phosphoric acid, and to contain phosphate of sodium, instead of being prepared, as the Pharmacopœia requires, from phosphorus. The pyrophosphate is liable to change through age, exposure to light, loss of ammonia due to insecure closure of the container. These changes are obscure, and affect the solubility of the pyrophosphate. To remedy the latter trouble, Mr. Baker advises the addition of citrate of ammonium before adding the acid; or, if decomposition has occurred, add citrate of ammonium and warm the mixture. Citrate of ammonium may be made by saturating ammonia with citric acid.

Arnica Salve.—Stearns, of Detroit, advises that, by means of steel rollers, and without heat, one part of fluid extract of arnica flowers be incorporated with fifteen parts of a mixture of "saxoline" oil (or fluid petrolatum), hard, white paraffin and wax. This possesses the odor of the flowers, and the proportion of solids determines its melting points.

NEW PATENTS.

Complete specifications and illustrations may be obtained of any one or more of the following patents by sending the number, title, name of patentee, with twenty-five cents fo each copy, to the Commissioner of Patents, at Washington, D. C., together with the name and address of the person requesting the same.]

283,785. *Handle for Carboys and Other Vessels.*—Fred. A. Howard, South Easton, Mass.

283,800. *Anæsthetic Mixture.*—Urial K. Mayo, Boston, Mass. Consisting of nitrous oxide gas and the vapor of an aqueous alcoholic tincture of an infusion of hops and poppies combined.

283,825. *Label Bottle.*—Geo. B. Shepard, Ogdensburg, N. Y. A label bottle or vial having on one side a raised portion integral with the body, and ground on its surface to form an opaque label-blank adapted to be written on with a pencil or crayon. [This was essentially described and illustrated some time since in NEW REM. as the invention of Mr. Robert Müncke, of Dresden.—ED. N. R.]

283,900. *Cork Turner.*—George W. Korn, New York, N. Y.

283,936. *Manufacture of Glycerin.*—Thomas G. Walker Morristown, N. J.

283,967. *Combined Can-Opener and Corkscrew.*—Stephen H. Chilcote, Sego, Ohio, assignor of one-half to Robinson F. Chilcote, John W. Chilcote, and Samuel F. Chilcote, all of the same place.

283,987. *Siphon Faucet.*—Norton A. Ellis, Boonesborough, Iowa.

284,011. *Apparatus for Distilling Water and Other Fluids.*—Wm. Hale Herrick, Grinnell, Iowa.

284,058. *Method of Distilling and Charring Wood, and Kiln Therefor.*—Henry M. Pierce, Chicago, Ill.

284,083. *A Physician's Portable Case.*—Samuel Jackson Stiner, Greenville, Ala.

284,212. *Method of and Means for Cooling Lard and Like Materials*—Edward Kells, Cleveland, Ohio.

284,257. *Nose-piece for Eye-Glasses.*—Wm. J. Suttie, New York, N. Y.

284,314. *Salve.*—Eliza P. Lucas, Starkville, Miss. Water, lard, suet, borax, alum, saltpetre, sal-soda, oil of sassafras, and turpentine.

284,335. *Eye-Water.*—George W. Scott, Defiance, Ohio. Sulphate of iron, sulphate of copper, sulphate of zinc, alum, rose-water, sulphate of morphia, hydrastis canadensis, and pure water.

284,367. *Process of Manufacturing Rosin and Spirit of Turpentine.*—Leonard Bellingrath, Castleberry, Ala.

284,437. *Process of and Apparatus for Preparing Petroleum Jelly.*—Edward D. Kendall, Brooklyn, N. Y.

284,598. *Purification of Mineral Oils.*—Alexander André, Paris, France. The method of separating the heavy oils from the residuum from the first distillation of mineral oils without decomposition, which consists in subjecting the same to centrifugal force, whereby the resinous matter is separated from the oil by reason of its greater density.

284,606. *Cover for Filters and Percolators.*—George F. Burton, Springfield, Ohio. (See August number of NEW REMEDIES.)

284,629 *Liniment.*—Francis Gullioma, New Baltimore, Ohio. Composed of alcohol, pure cider vinegar, kerosene oil, spirits of turpentine, ground Cayenne pepper, ground French mustard, flowers of sulphur, ground ginger, and carbolic acid.

284,718. *Polishing Compound.*—George W. Buckalew and Patrick Quinn, New York, N. Y. Composed of chalk and peroxide of iron, in fine powder, mixed with oleic acid and lard.

284,742. *Separation of Nitric Acid from a Mixture of Nitric and Sulphuric Acids.*—Fred. Joneson, San Fran

cisco, Cal. The separation from a mixture of nitric and sulphuric acids, the nitric acid, in separate portions or quantities of different strengths and by a continuous operation, consisting in passing a continuous stream of the mixture through a connected series of retorts, to which are given separate degrees of heat, and in distilling the nitric acid over from each retort into separate receivers.

284,751. *Dentifrice.*—Alfred P. Merrill and John Eastwood, Socorro, New Mexico. Consisting of the root of amole, or soap-weed, reduced to a powder

284,752. *Oil-saving Contrivance.*—William M. Mixer, New York, N. Y.

284,817. *Apparatus for the Manufacture of Hydrated Sulphurous Acid.*—Frederick Carlisle, Newark, N. J., assignor to the National Chemical Machine and Manufacturing Co., same place.

284,862. *Process of Treating Fats and Oils.*—Mark H. Lackersteen, Chicago, Ill. The process of treating fats and oils for the preparation of fat acids and glycerin, consisting in first producing an emulsion of the fat or oil with water, and then converting the same into fat acid and glycerin by the application of electro-motive force.

284,918. *Hair Tonic.*—Wm. M. Stark and Frank George, Mayfield, Ky., said George assignor to said Stark. Composed of coal oil, bayrum alcohol, oil of bergamot, oil of wintergreen, tincture of cantharides, and camphor.

285,045. *Hair Tonic.*—George A. Leip, Leadville, Col Consists of an infusion of potatoes, onions, and sage.

285,054. *Medicine Spoon.*—John Moffit, Chicago, Ill.

285,143. *Hollow Cork-Screw.*—Samuel T. McDougal, Brooklyn, N. Y. Assignor of one-half to Willis A. Barnes, New York, N. Y.

285,160. *Device for Increasing the Organic Action of the Blood, or Medical Manipulator.*—James Rice, Detroit, Mich.

285,168. *Combined Measure and Funnel.*—John P. Schüssler, Jr., and Henry C. Kerston, New York.

285,220. *The Process of the Manufacture of Oils from Oleaginous Seed.*—Robert B. Brown, St. Louis, Mo

285,458. *Bottling Machine.*—John Bryan Bloomington, Ill.

285,579. *Process of Producing Alumina.*—James D. Darling, New York, N. Y., assignor of fifty-five one hundredth to Alfred Sims, Alexander Pyle, William Lindsay, and George F. Betts, all of the same place.

285,598. *Process of and Mechanism for Extracting Oils.*—John W. Evans, Cleveland, Ohio.

285,753. *Nasal Inhaler and Irrigator.*—James Kick Portland, Or.

Labels.

3,467. "*The Little Sampson.*"—James Lendall Ba ford, Boston, Mass.

3,472. "*Medical Wonder.*"—Robert B. Robiso n, Allegheny, Pa

3,473. "*Dr. Thurman's Embrocation.*"—William S. P. Thurman, St. Louis, Mo.

3,477. "*Zingari, the Gypsie Queen's Secret.*"—E. E. Murray & Co., New York, N. Y.

3,482. "*German Cough Remedy.*"—Solomon M. Cooper, Philadelphia, Pa.

3,483. "*Dr. Decker's Shakes and Malaria Cure.*"—William F. Decker, Paterson, N. J.

3,494. "*Dr. Liebig's German Invigorator.*"—Archibald C. Stoddart, San Francisco, Cal.

3,502. "*Wilson's Cough Annihilator.*"—Frederick H. Wilson, Brunswick, Me.

3,505. "*Horehound Balsam.*"—Frank E. Eaton, Syracuse, N. Y.

3,506. "*The American Wonder—America's Tree of Life and Knowledge.*"—Lewis B. Greenslade, Los Angeles, Cal.

3,509. "*Mrs. Day's Worm Remedy.*"—Charles E Houghtaling and George E. Ferguson, Albany, N. Y.

3,510. "*Mrs Day's Baby Cordial.*"—Charles E. Houghtaling and George E. Ferguson, Albany, N. Y.

3,514 "*Oakes' Balm of Life.*"—J. E. Oakes, Haverhill, N. H.

3,516. "*Pickit's Purifying Syrup.*"—J. B. Pickit, Fergus Falls, Minn.

3,520. "*Capsicum Oil*"—Gershom H. Swezey, New York, N. Y.

3,522. "*Le Boutilli r's Marvellous Catarrh Cure.*"—Arlington Le Boutillier, New York, N. Y.

3,528. "*John's Magic Pain King.*"—Clarence A. Fonerden, New York, N. Y.

3,529. "*Rheumatic Cure.*"—Charles H. Hammit, Oakland, Cal

3,530. "*Brazilian Balm.*"—Benjamin F. Jackson, Wilmington, Del.

3,532. "*Henry's Remedy for Cholera, etc.*"—Thomas Henry McNellis, Boston, Mass

3,533. "*Dr. Moore's Fragrant Solace for Cleansing and Preserving the Teeth.*"—Thomas W. Moore, Philadelphia, Pa.

3,534. "*Pick's Magic Mixture.*"—Ida J. Plass, Detroit, Mich.

3,535. "*Tokalon.*"—Robert B. Robison, Allegheny, Pa.

3,542. "*A Sure Thing for Syphilis in All Its Forms.*"—George K. Elder, Kansas City, Mo.

3,545. "*Dr. A. A. Mann's Cream of Life Pills.*"—Alice M. Mann and Eugene S Steward, Skowhegan, Me.

3,546. "*Triumph Pills.*"—Robert B. Robison, Allegheny, Pa.

The National Wholesale Drug Association held its convention in New York, on Wednesday and Thursday, the 17th and 18th of October, and was followed by an excursion and a dinner. The Amer. Pharm. Assoc. and the Nat. Retail Drug Assoc were represented by delegates, among whom Messrs. T. J. MacMahan, of New York; Sayre, of Brooklyn; Brown, of Camden, and Colcord, of Lynn, were prominent. The time of the convention was largely consumed in discussion of matters relating to rebate, insurance, commercial travellers, alcohol tax, etc. W. A. Gellatly was elected president.

PHARM. CALENDAR FOR NOVEMBER.

N. B.—The officers of Societies, Colleges of Pharmacy, Pharm. Associations, etc., will oblige us by forwarding schedules of their meetings, lists of officers, and any changes that may be desirable.

Date.	Society Meetings.
Thurs. 1st.	Louisville (Ky) Coll. Pharm.
	Philadelphia Coll. Pharm.—Alumni Assoc.
Friday, 2d.	Cleveland Pharm. Assoc.
	Am. Chemical Soc.—New York.
Mon. 5th.	Erie Co. (N. Y.) Pharm. Assoc.—Buffalo.
Tues. 6th.	St. Joseph (Mo.) Pharm. Assoc.
Thurs. 8th.	Newark (N. J.) Pharm. Asso.
	Philadelphia Coll. Pharm.—Alumni Association.
	Maryland Coll. Pharm.—Baltimore.
	N. Y. German Apothecaries' Soc.
	Lancaster Co. (Pa.) Pharm. Assoc.
Tues. 13th.	Massachusetts Coll. of Pharm.—Boston.
	Kings Co. (N. Y.) Pharm. Assoc.—Brooklyn.
	National Coll. Pharm.—Washington.
Wed. 14th.	New York Boark of Pharm.
Tues. 20th.	St. Louis (Mo) Coll. of Pharm.—Alum. As.
	Philadelphia Coll. of Pharm.
	St. Joseph (Mo.) Pharm. Assoc.
Wed. 21st.	So. Carolina Pharm. Assoc.
Thurs. 22d.	Kings Co. (N. Y.) Board of Pharm.—B'klyn.
Tues. 27th.	Boston (Mass.) Druggists' Assoc.

Commencing on the 20th, and continuing until the 23d, the second annual International Exhibition of the "Bottlers' Association," at Irving Hall (Irving place and 15th street), New York.